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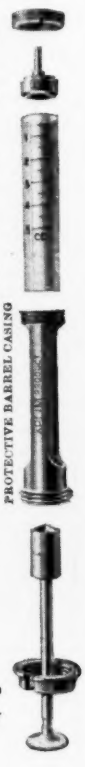

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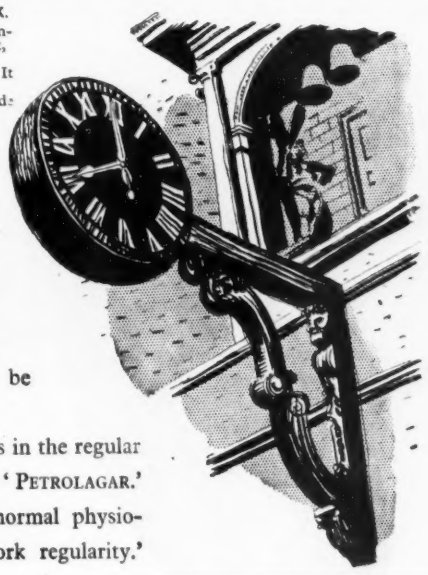

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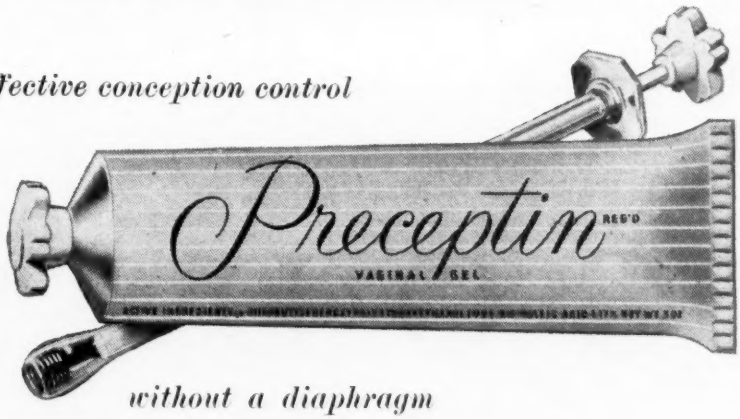

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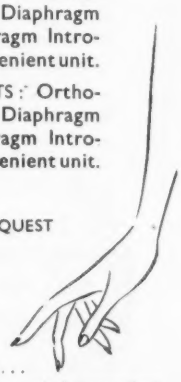

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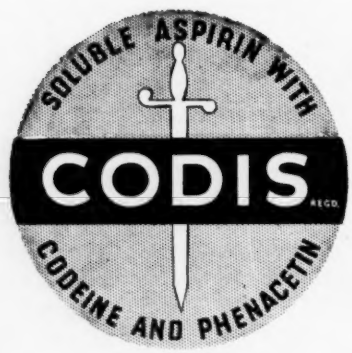

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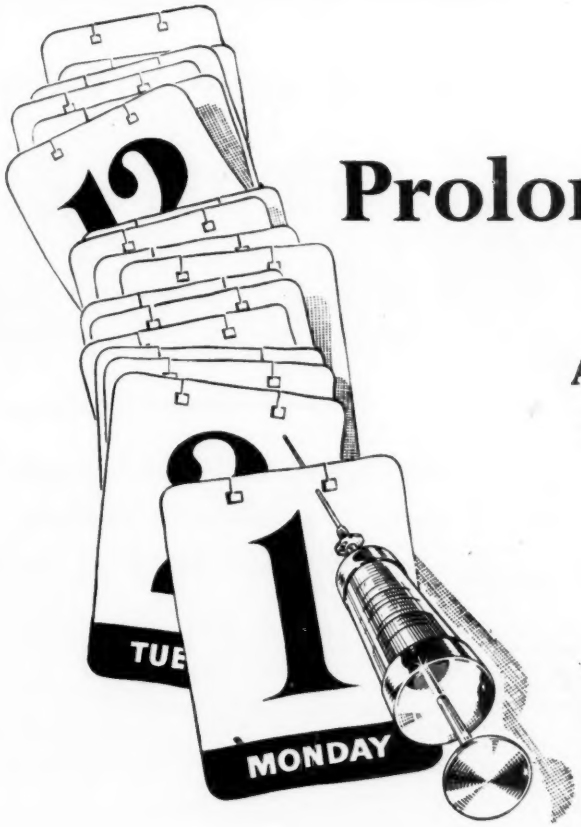

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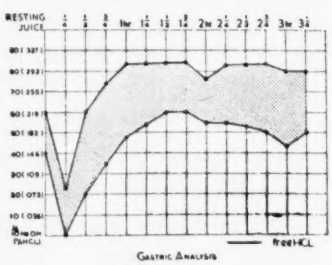

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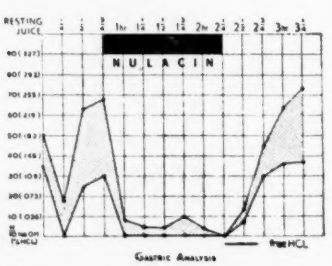

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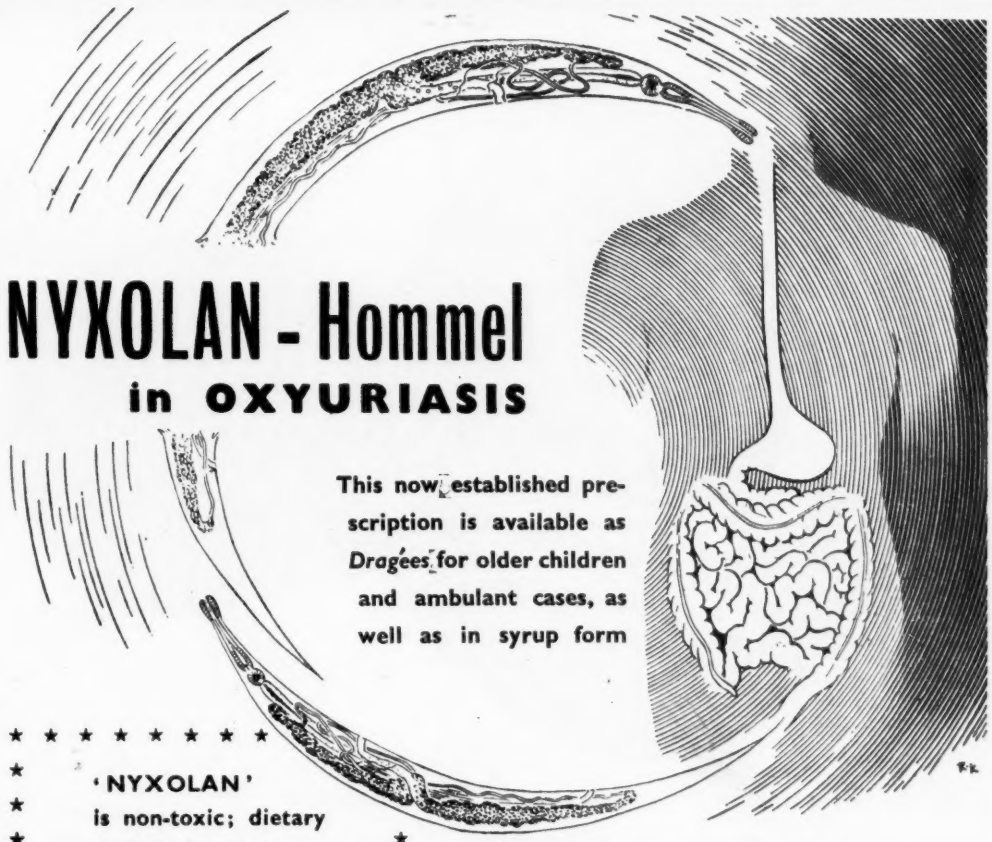

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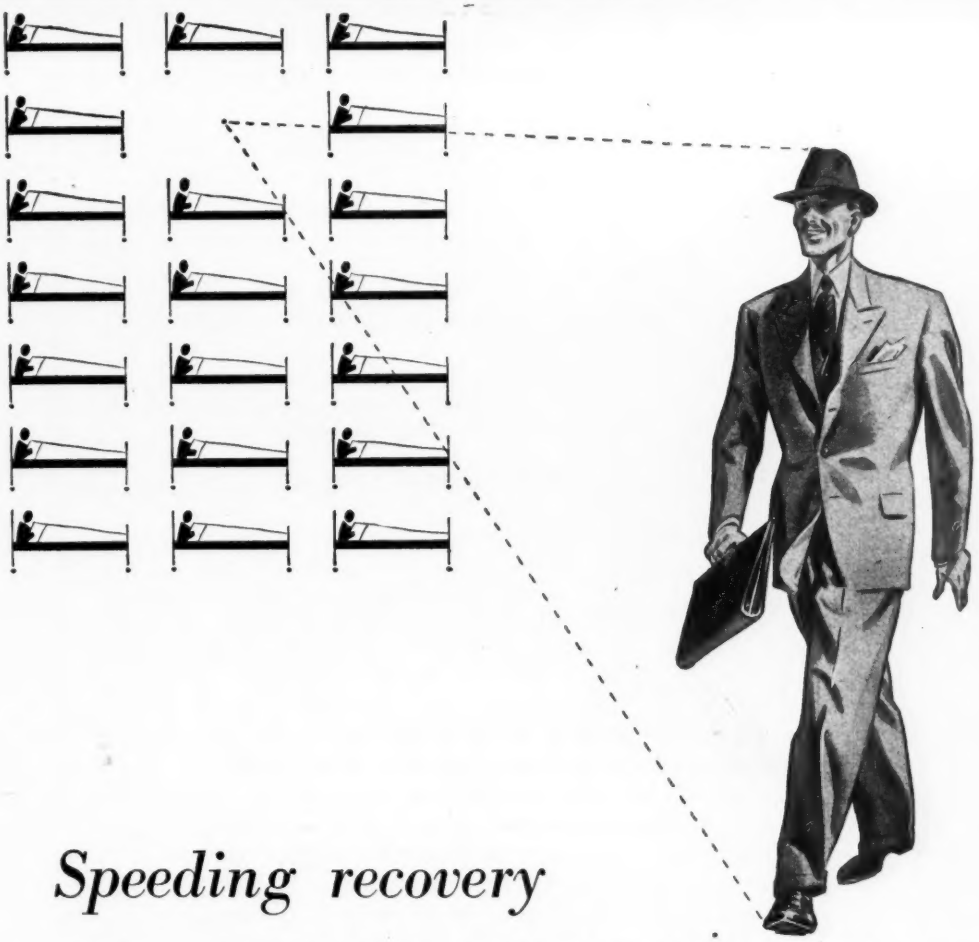

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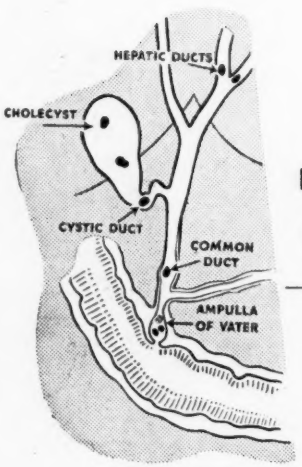

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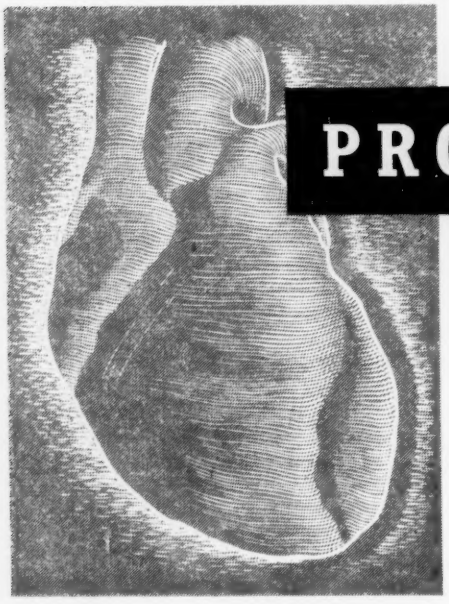

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1. *See Brit. Med. J., Dec.* 27, 1952. *page* 1394
2. *See Lancet, Nov.* 29, 1952, *page* 1084

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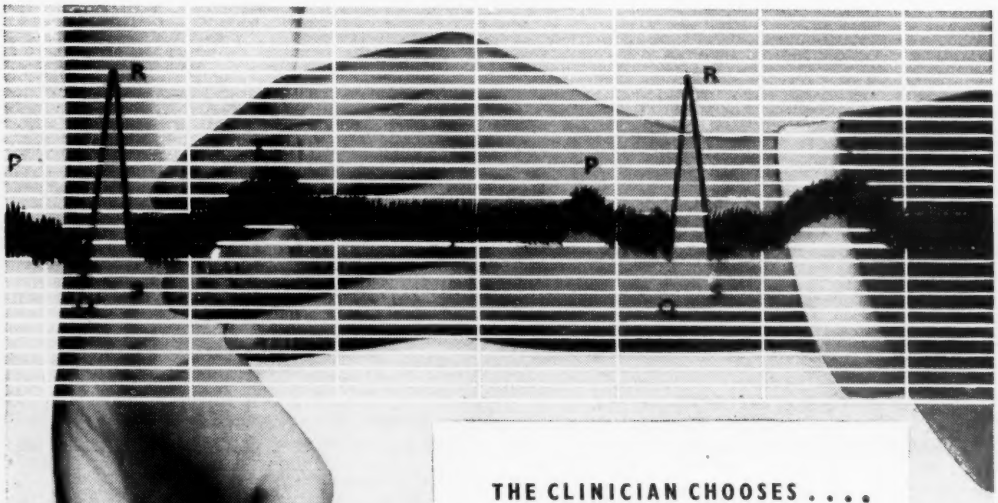

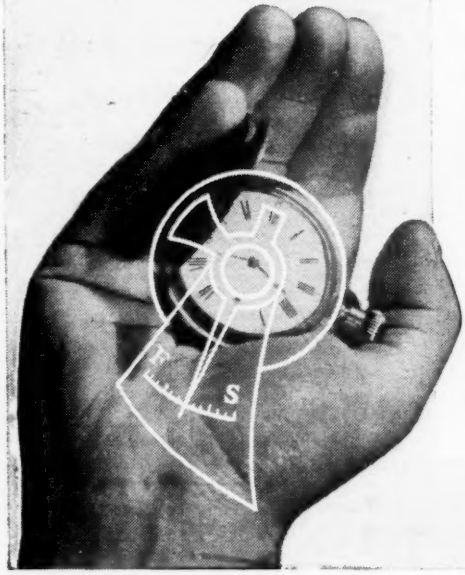

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BODY-FLUID DEPLETION*

D. A. K. BLACK
M.D., B.Sc. St. And., F.R.C.P.
LECTURER IN MEDICINE IN THE UNIVERSITY OF MANCHESTER

THERE is some truth in the statement that potassium stands in a relation to intracellular fluid similar to that which sodium bears to extracellular fluid. The great deposit of potassium lies within the cells, and the extracellular moiety of potassium is even smaller than the amount of intracellular sodium. Moreover, I hope to show later that potassium depletion, even of quite moderate degree, is attended by a diminution in volume of intracellular fluid (I.C.F.), and that with more advanced depletion the concentration of potassium in I.C.F. falls—quite a close functional analogy to what happens in sodium depletion to the volume and sodium concentration of extracellular fluid. There are, however, important differences, both quantitative and qualitative, between sodium and potassium in their respective phases of body-fluid. As we have seen, sodium accounts for over 90% of the base of extracellular fluid; but the predominance of potassium in intracellular fluid is less striking, for it forms at most two-thirds of the total base, the remainder being largely magnesium. Sodium is somewhat inert pharmacologically, so much so that in America it has been dubbed "osmotic stuffing"; but no-one has cared to take similar verbal liberties with potassium, in view of its well-known actions on neural transmission and muscular contraction. Even in a presentation mainly concerned with the relation of potassium to body-fluid, these pharmacological effects of the potassium ion demand some attention; but I cannot discuss them in the detail they deserve, and would refer you for this to the well-known review by Fenn (1940).

Physiologists have known for decades that lack of potassium in the surrounding medium will impair muscular contraction. The clinical counterpart to this is found in familial periodic palsy, whose centenary in description we may celebrate this year (Cavaré 1853). This relationship was first clearly established by Aitken et al. (1937), although with the spurious wisdom of hindsight we could commend Sir Farquhar Buzzard on his acumen in giving potassium tartrate to his patients in 1901. While these exciting discoveries were being made about extracellular potassium, the great mass of body-potassium lay neglected inside the cells, remote from direct analysis and untroubled by isotopes. Admittedly, balance studies commonly included potassium, as a measure of changes in intracellular fluid (Gamble, Ross, and Tisdall 1923); but the existence of potassium depletion involving mainly the cells was not established and shown to be clinically significant until the work of Darrow (1945). Darrow (1946) himself cites many examples in the literature, from as far back as Schmidt (1850), of diarrhœa associated with notable potassium loss. The observed losses often exceeded the total extracellular potassium, and must therefore have come in part from the cells; but the view that cell membranes were virtually impermeable to cations held sway, and inhibited any serious consideration of potassium depletion being predominantly an intracellular affair. By 1945, a dynamic approach to the problems of cell electrolyte composition had largely replaced the static schema centred on membrane permeability; and also by that time escape of potassium from cells had been demonstrated experimentally in several different contexts. For example, frog muscle in vitro lost potassium to the medium when this was made more acid or of lower potassium concentration (Fenn and Cobb 1934). Muscular contraction had been shown to be associated with loss of potassium (Fenn and Cobb 1936). Breakdown of glycogen or of tissue protein was known to be associated with discharge of potassium from the cells (Fenn 1940). Darrow's discovery of a large intracellular potassium deficit in infants with diarrhœa could therefore be readily accommodated in current theory—perhaps a necessary condition for the acceptance of all except the very greatest advances in knowledge.

By observing the retention of nitrogen and potassium during recovery, Darrow (1946) was able to show that potassium was retained in considerable excess of the amount which could be accounted for by tissue protein repair, as estimated from the positive nitrogen balance—a state of affairs which is often summarised in the phrase "retention of potassium in excess of nitrogen." Of the 6 infants studied, 2 had retention of potassium equivalent to 19% and 23% of the estimated normal potassium content of the body; the other 4 had retentions around 10% of the estimated total. Analysis of muscle from infants who had died from gastro-enteritis showed a potassium content up to 40% less than the normal. The inference that potassium deficits of this order should be treated by replacement therapy is supported by the findings of Govan and Darrow (1946). Of 53 infants treated by "conventional therapy" 17 died, whereas of 50 treated with potassium chloride in addition to the standard treatment, only 3 died.

Potassium Loss in Gastro-intestinal Disease

It was appropriate that the first clear demonstration of gross potassium depletion should have been made on gastro-intestinal disease; for the commonest mechanism for the loss of potassium, as indeed of sodium, from the body is escape of gastro-intestinal secretions, associated as a rule with interference with food intake. For example, Martin et al. (1951) found that 81% of patients suffering from potassium depletion had disease of the gastro-intestinal tract. Lans, Stein, and Meyer (1952) found a similar preponderance of gastro-intestinal disease in their series; they report analyses of different secretions, showing that the potassium concentration is usually distinctly higher than that of plasma (table II). From these analyses, and from the volumes of the various gastro-intestinal secretions given by Gamble (1947), the total daily secretion of potassium into the alimentary tract is of the order of 66 m.eq., or 2·6 g.—about as much as is found in a mixed diet. Reabsorption of this potassium may be impeded by ion-exchange resins in the hydrogen cycle given by mouth; these have on occasion led to significant potassium depletion (Dock and Frank 1950).

Although gastro-intestinal secretions usually contain more potassium that is found in plasma, they contain much less potassium than they do sodium, and it is not altogether easy to see why gastro-intestinal disease can cause deficits of potassium quite comparable in absolute magnitude to those of sodium. However, other factors come in to modify the expectation that more sodium would be lost than potassium. When gastric juice contributes largely to the total loss, the relatively low Na/K ratio in this particular secretion will be reflected in a relatively high potassium loss. When on the other hand the main loss is by diarrhœa, the ratio of K/Na in the stools is much higher than in pure gastro-intestinal secretions. In the 6 infants studied by Darrow (1946), the loss of sodium in the stools often exceeded that of potassium when the stools were watery, but when the water content of the stools dwindled the loss of potassium exceeded that of sodium. Normal stools contain more than twice as much potassium as sodium (Shohl 1939); and when urine is introduced into the colon, and retained for three hours, the amount and concentra-

* The second Goulstonian lecture for 1953, delivered before the Royal College of Physicians on Jan. 15.

TABLE II—SODIUM AND POTASSIUM CONCENTRATIONS AND RATIOS IN ALIMENTARY SECRETIONS AND IN STOOLS

Material	No. of samples	Average [Na] m.eq/l. or m.eq./kg.	Average [K] m.eq./l. or m.eq./kg.	Na/K ratio
Gastric juice	76	56	12·6	4·5/1
Bile	48	151	5·2	29·0/1
Gastric secretion	64	113	4·6	25·0/1
Intestinal suction	12	121	9·6	13·0/1
Ileal fistula	12	132	6·2	21·0/1
Gastro-enteritis in infants:				
(*a*) Watery stools	11	68	42·0	1·6/1
(*b*) Formed stools	6	25	56·0	1·0/2·2
Normal infant stools*	..	1·3	3·8	1·0/2·9
Normal adult stools*	..	5·0	12·0	1·0/2·4

*Milli-equivalent per day.

The analytical results are from these sources:
Alimentary secretions: Lans, Stein, and Meyer (1952).
Stools in gastro-enteritis: Darrow (1946).
Normal stools: Shohl (1939).

tion of sodium usually fall, but the potassium increases in concentration and amount (Annis and Alexander 1952). Although much of the potassium in stools may be bacterial and unavailable for reabsorption, the experiments with urine suggest that the colon can absorb sodium, but not potassium. This must operate in favour of enhancing potassium loss, and diminishing sodium loss, although there is ample evidence that in really copious diarrhœa sodium conservation by the colon is overborne. Quite apart from these local factors making for a higher potassium loss relative to sodium than would be predicted from analysis of isolated secretions, there are general factors which make the body more vulnerable to potassium than to sodium depletion, in the sense that any given external deprivation of potassium will produce a greater intrinsic depletion than would the corresponding external deprivation of sodium. Notable among these is the relative inefficiency of the kidneys in conserving potassium in response to depletion (Tarail and Elkinton 1949). There is no doubt that the kidney can conserve potassium by excreting a urine of lower potassium concentration than plasma (Mateer et al. 1949, Fourman 1952); and the progressive renal conservation of potassium is quite clearly seen in normal subjects on a very low potassium intake (Black and Milne 1952). As a rule, however, in clinical potassium depletion the urinary excretion of potassium remains considerable, although not so high as in the normal person. The occasional competence of the kidney to conserve potassium suggests that its usual failure to do so may be largely conditioned by extrarenal factors. These include glycolysis, protein breakdown, and acidosis, all of which make potassium from cells available for excretion. Acidosis may have a more direct action on the kidney itself, in that potassium may be drawn on as a base for excretion with fixed acid. The extent to which the adrenal cortex is overactive in disease states is still a matter of considerable controversy; an increased output of cortical hormones would increase renal excretion of potassium and diminish that of sodium, and to that extent might be operative in equalising sodium and potassium deficits even when the extrarenal loss of sodium was greater.

Loss of Potassium in the Urine

Although gastro-intestinal disease, including steatorrhœa (Harrison et al. 1943), was the earliest recognised cause of clinical potassium depletion, and remains the most frequent, potassium depletion has been demonstrated in other types of disease, the common factor being an abnormal loss of potassium in the urine. As with sodium, diminished intake of potassium plays only a subordinate part as compared with abnormal loss. The precise part played by the kidney itself in these abnormal urinary losses of potassium varies. Sometimes it is responding normally to a shift of potassium from cells into the extracellular fluid (E.C.F.); at other times it seems to be more directly "at fault," in that it excretes potassium from an extracellular fluid which is apparently normal in respect of that ion, or even depleted. This may happen under the influence of hormones or foreign substances, or because of intrinsic renal disease.

The distinction between what we may call "metabolic" and "renal" loss of potassium in the urine may not be easy to make; for one thing, the kidneys are part of the body, and the tubule cells are subject to the same hormonal stimuli as the other body cells. Also, a primary renal loss of potassium will induce a secondary transfer of potassium from cells to extracellular fluid, and conversely metabolic release of potassium soon invokes renal mechanisms of increased excretion. Even in a condition so ostensibly "metabolic" as diabetic ketosis, the loss of potassium from the body is only partly related to release of potassium from the cells due to acidosis, glycogen depletion, and protein breakdown; it is certainly augmented by the renal effects of acidosis and osmotic diuresis (Brodsky and Rapoport 1951), and also possibly by increased adrenocortical activity (Stowers 1951). In spite of such difficulties, it is still possible to find examples of potassium depletion which are predominantly "metabolic" in origin, and others which are "renal." In the first group we may include the potassium depletion associated with tissue breakdown (Howard and Carey 1949), primary water depletion (Black, McCance, and Young 1944, Elkinton and Winkler 1944), and mobilisation of glycogen stores (Fenn 1939). The potassium depletion induced by saline infusion (Coller et al. 1945), or observed postoperatively (Pearson and Eliel 1949) is probably of mixed metabolic and renal origin, like that in diabetic coma. The excretion of potassium by normal kidneys is increased by deoxycortone or by natural adrenal cortical hormones, as in Cushing's syndrome; potassium excretion is also increased by *p*-aminosalicylic acid (Cayley 1950), by liquorice (Strong 1951), and by mercurial diuretics (Blumgart et al. 1934). In primary renal failure, potassium wastage is uncommon, although paralysis related to potassium depletion has been described (Brown et al. 1944). Usually potassium excretion remains adequate to keep the serum-potassium normal, in spite of the greatly reduced glomerular filtration of this ion; secretion of potassium by the tubules can sometimes be inferred from an excess of excreted over filtered potassium (Platt 1950). Potassium depletion of renal origin, in the absence of uræmia, has been reported in renal tubular acidosis and the de Toni-Fanconi syndrome (Milne, Stanbury, and Thomson 1952), and in the "early diuretic phase" of recovery from anuria (Bull, Joekes, and Lowe 1950). Potassium depletion observed in association with chronic alkalosis may also be of renal origin (Stanbury and Thomson 1952).

Recognition of Potassium Depletion

Knowledge of the various mechanisms which can lead to potassium depletion is of considerable importance, since the clinical picture is neither obtrusive nor well defined, except for paralysis which is by no means a constant finding. Moreover, the biochemical demonstration of potassium depletion may be far from easy in the individual patient; for the serum level of potassium may be within the rather wide normal range of 3·5–5·6 m.eq. per litre (Wootton et al. 1951), or may even be raised, when concurrent sodium depletion has reduced the E.C.F. volume at a time when potassium is streaming out of the cells (Danowski et al. 1949). On the other hand, the serum-potassium may be low in the absence of a general body deficit of potassium, owing to an excessive uptake of potassium into cells. This may happen spontaneously, in periodic paralysis (Danowski et al. 1948), or secondarily

to rapid deposition of glycogen when insulin and glucose are given (Keys 1938). Retention of potassium is easily demonstrable during recovery from potassium depletion (Nabarro et al. 1952a), but does not of course afford a rapid assessment of the severity of depletion. Determination of the potassium content of muscle obtained at biopsy (Mudge and Vislocky 1949) likewise gives information of value but not of immediate clinical applicability. The potassium content of red blood-cells may not always be representative of that of tissue cells (Eliel et al. 1950); in moderate experimental potassium depletion, the potassium concentration in erythrocytes did not change appreciably (Black and Milne 1952). Determination of exchangeable potassium in the body with K^{42} may become the basis of a clinical test for potassium depletion, but the method has not yet been sufficiently explored. There is some evidence that the urinary output of potassium after a standard oral dose of potassium salts is related to the existing potassium household, and may thus be used as a clinical measure of potassium depletion. In the meantime, I would draw your attention to the more fundamental problem of assessing to what extent the multifarious clinical symptoms which have been described in association with potassium depletion can in fact be fairly ascribed to this particular biochemical distortion.

Symptoms Caused by Potassium Depletion

Muscular weakness and paralysis seem to be generally related to the serum-potassium level rather than to "global" potassium depletion; this is most clearly seen in periodic paralysis, in which a shift of potassium into the cells brings on an attack, without any net loss of potassium from the body (Danowski et al. 1948). Even here, however, the relationship is not strict, for Allott and McArdle (1938) point out that paralysis may be absent at levels of serum-potassium lower than those associated with attacks in other patients. The electrocardiographic changes seem also to be related to the serum-potassium level rather than to the total potassium deficiency in the body (Darrow and Pratt 1950). On the other hand, complete or partial atony of the smooth muscle of the bowel has been attributed to depletion of intracellular potassium, and this has even been adduced as a cause of paralytic ileus (Streeten and Ward-McQuaid 1952). The argument here does not seem completely rigid, at least in the experimental work quoted (Streeten and Vaughan Williams 1952); for the method used to deplete intracellular potassium would be associated with entry of sodium into the cells, and this might be the more important change. It has been shown that various enzyme actions are inhibited by sodium and potentiated by potassium (Cannon 1952), making it difficult to assign special importance to either ion when there is a reciprocal shift of both. Besides, the low intracellular potassium observed could be a sequel rather than a cause of paralytic ileus. Eliel, Pearson, and Rawson (1950), in patients after operation, have demonstrated potassium depletion, and they describe in association with this a formidable list of symptoms—"apathy, lethargy, nervousness and irritability, muscular weakness, abdominal distension and occasional ileus, occasional confusion, disorientation, delirium, muscular twitching and tetany, electrocardiographic changes and occasional arrhythmias and œdema." Other workers have made similar claims in other clinical contexts, but the account given by Eliel et al. may be taken as representative.

It will at once be noted that many of these symptoms are those with which we are familiar in any severe illness. In view of the ease with which potassium escapes from cells under abnormal conditions, we cannot dismiss out of hand the hypothesis that intracellular potassium depletion produces these striking effects. It seems just as reasonable, however, to suppose that potassium loss from cells is only one facet of a general biochemical distortion, and not necessarily the most important. These conflicting views cannot be critically tested in patients, for the conditions which cause clinical potassium depletion also cause loss or imbalance of other electrolytes. Even the amelioration of symptoms with repair of an intracellular potassium deficit is not absolutely certain evidence that these symptoms were due to the deficit, for potassium salts will modify the anion balance of the body as well as supply potassium to cells. The complications inherent in clinical studies can sometimes be evaded in part by an experimental approach, in which a depletion of the substance under consideration is established in normal subjects. This experimental method has in turn its own limitations. It cannot be carried *à outrance*, except in animals, and these cannot be used in a study partly designed to assess the significance of human symptoms. The purity of the depletion induced, which is the great virtue of experimental work on electrolytes, may also be a drawback, in that we lose contact with those synergisms of ion depletion which may be the essence of an actual clinical situation. Finally the means employed to induce a "pure" depletion may involve extensive juggling with food and way of life in general, so that the subjects are well aware of what is going on, and symptoms may sprout too luxuriantly on this conditioned soil.

Apart from these general limitations of the experimental method, its application to potassium depletion has been beset by the special difficulty that almost all natural foods are rich in potassium, and a really "low-potassium" diet must also be a rather strange one. For small animals, synthetic diets can and have been used to provide a balanced food intake; but the quantities needed for man would be very costly. An electrolyte-free diet of good calorie content is indeed available in the glucose/arachis-oil mixture devised for the maintenance of patients with anuria; but this diet is also protein-free, a disadvantage when tissue breakdown is to be avoided as far as possible. The introduction of exchange resins has made it possible to remove potassium from foods or from the alimentary tract; this method has been used in two recent experimental studies (Black and Milne 1952, Fourman and Ainley-Walker 1952). Milne and I used a resin in the sodium cycle, and passed 3 litres of milk through it each day, giving us a diet adequate in calories and protein, very low in potassium, and rather high in sodium. Fourman used a resin in the hydrogen cycle, so that the potassium withdrawn from the body

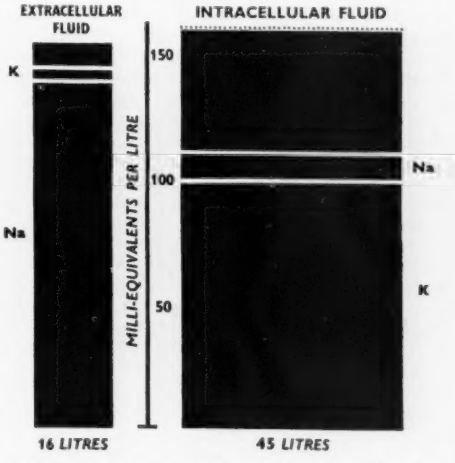

Fig. 3—Distribution of sodium and potassium in extracellular and intracellular fluid. Concentrations of electrolyte on the ordinate, volumes of the respective compartments on the abscissa, so that areas represent total amounts of electrolyte.

was replaced by hydrogen ions, giving a combined acidosis and potassium deficiency. A further important difference between the two studies was that with actual ingestion of the resin Fourman was able to withdraw some potassium directly from the body, and also in his subjects urinary excretion of potassium remained high, presumably because of the acidosis; whereas in our subjects actual potassium loss was almost entirely urinary, and became rapidly curtailed. For these reasons, his potassium deficit became much greater.

Experimental Depletion

The detailed results of our experiments have already been published (Black and Milne 1952), and here I shall only summarise the main findings, and discuss one or two conclusions which I think can be drawn from them and are of some general interest. Two normal subjects were put on a diet containing less than 10 m.eq. of potassium daily, in contrast to a normal dietary intake in the preliminary periods of 140 m.eq. daily. In spite of the low intake, both subjects continued at first to excrete sizable amounts of potassium in the urine, and the cumulative loss of potassium was 268 and 289 m.eq. in the two subjects. The rapid initial loss of potassium

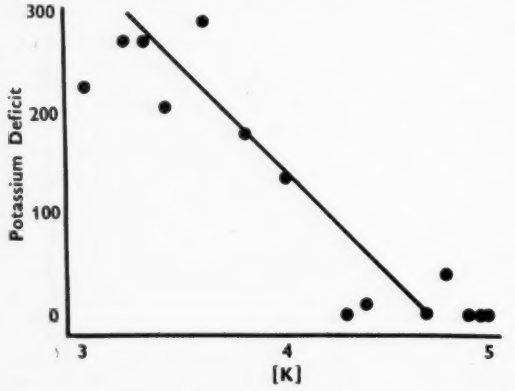

Fig. 4—Relation between body-potassium deficit and serum-potassium concentration

soon diminished, and by the sixth day both subjects were very little removed from balance, even with the low intake used. The low urinary excretion of potassium continued into the after-period, in which a high potassium intake was given; under these conditions, potassium was retained to an amount considerably greater than the pre-existing deficit. The serum-potassium fell progressively as the potassium depletion increased, and under our experimental conditions the serum-potassium level was negatively correlated with the cumulative negative potassium balance ($r = -0{\cdot}762$, $P < 0{\cdot}01$). This relationship is of course commonly departed from in clinical conditions where potassium depletion is complicated by a diminished E.C.F. and plasma volume, the results of concurrent sodium depletion.

The fall in serum-potassium coincided with a rise in serum-bicarbonate, and there was a negative correlation between them ($r = -0{\cdot}89$, $P < 0{\cdot}01$); the possible significance of this finding will be discussed later. Serum levels of sodium and chloride showed small changes, diverging sufficiently to accommodate the increment in bicarbonate. The urine became less acid during the resin periods, and the output of ammonia and titratable acidity fell; these urinary changes are at least in part related to a diminished intake of chloride during the resin period, during which sodium was supplied from the resin, and not in combination with chloride, as in the preliminary and after periods. There was during the resin period a large retention of sodium, and even of chloride, although the chloride intake was lower during the resin period than beforehand. When the potassium depletion was repaired, there was a corresponding sodium and chloride diuresis. The balances showed no significant loss of calcium or magnesium, but during the resin period there were small losses of nitrogen and phosphorus. The losses of both these substances were much smaller than would have been observed had potassium, nitrogen, and phosphorus been lost together in the proportions found in tissue cells. There was no loss in weight during the period of potassium depletion.

Some interesting comparisons can be made between our experience of potassium depletion and that of Fourman, in relation to the clinical question "Does moderate potassium depletion per se cause any notable symptoms?" In our experiments, there were no dramatic symptoms, except when one of us took 3 g. of ammonium chloride, and felt rather ill after it. Otherwise we were able to perform our normal tasks, it may be with diminished efficiency. Our daily portion of 3 litres of sweetened milk was no more distasteful when we were short of potassium. We had no muscular weakness, although the serum-potassium fell on one occasion to 2·6 m.eq. per litre. The harmful effect of ammonium chloride tallies rather well with Fourman's more fully documented experience in this respect, and also with clinical observation. During the resin period, when Fourman's subjects were both acidotic and potassium-depleted, they "felt and looked very ill, took their diet with extreme difficulty, and became absent-minded and then confused." During the recovery period of his experiments, the acidosis receded within a few days, and the plasma-bicarbonate rose above control values; there was still considerable potassium depletion, but at this stage symptoms were not dramatic, although "the subjects were morose, apathetic, and tired easily." One subject drove to North Wales and did some hill-walking, with a deficit of 600 m.eq. of potassium. The experimental evidence may be summarised in the statement that moderate potassium depletion does not in itself cause severe symptoms, but it may do so when associated with acidosis.

The relevance of these experimental findings to clinical medicine obviously depends on there being no great quantitative divergence between the experimental and the clinical deficits of potassium. This criterion of relevance is satisfied, at least so far as acute clinical potassium depletion is concerned. The actual potassium deficit in patients is unknown, but can be gauged from the retention of potassium observed during recovery. Two such studies on patients recovering from diabetic coma give retentions ranging in one series from 130 to 450 m.eq., with an average of 290 m.eq. (Danowski et al. 1949), in another from 147 to 385 m.eq. with an average of 279 m.eq. (Nabarro et al. 1952a). The observed retention of potassium in our two subjects was 415 and 348 m.eq., and in Fourman's subjects there were deficits of 338, 674, and 839 m.eq. The experimental potassium deficits are therefore somewhat greater than those observed in acute clinical potassium depletion; but appreciably higher retentions, up to 1000 m.eq., have been recorded in chronic potassium depletion associated with loss of gastro-intestinal secretions (Martin et al. 1951).

Acidosis and Potassium Depletion

How are we to explain the undoubted occurrence of symptoms related to potassium depletion in a proportion of patients recovering from diabetic coma, when experimental depletion of similar or greater magnitude causes no such symptoms? It may be that the acidosis which is still present into recovery is potentiating the low serum-potassium as a cause of symptoms; acidosis seemed to have this action in both the experimental studies just quoted. I have seen profound apathy and muscular

weakness in a patient recovering from diabetic coma whose serum-potassium was 3·1 m.eq. per litre, but whose bicarbonate was only 20·2 m*M*. per litre. Potassium chloride was given by mouth, and the apathy and weakness disappeared in an hour or two; the serum-potassium rose to 5·6 m.eq., but the mild acidosis remained uncorrected. By contrast, I have seen a patient with pyloric stenosis, whose serum-potassium was only 2·1 m.eq. per litre, but he was alkalotic with a bicarbonate of 38·2 m*M*. per litre; there was no demonstrable muscular weakness. Allott and McArdle (1938) have already noted the absence of paralysis in a patient with pyloric stenosis, and a serum-potassium of only 2·0 m.eq. In further and more general support of my contention that potassium depletion is more likely to cause symptoms when associated with acidosis, perhaps I may quote the independent clinical experience of Smart (1952), who says: "It is unusual to see paralysis in cases of potassium deficiency, but when it does occur it is usually seen in patients who are recovering from diabetic coma, in subjects with renal lesions such as chronic nephritis, or so-called calcinosis, or, much more rarely, in subjects with sprue and in patients with Addison's disease who have received too much DOCA." All these are conditions likely to be associated with acidosis, with the apparent exception of treated Addison's disease. I hope that what I have later to say on the so-called "hypochloræmic alkalosis" of potassium depletion may explain this solitary departure from the predicted association of symptoms with acidosis. Although there are obvious risks in transferring in-vitro evidence to a clinical situation, it is perhaps pertinent to mention here that the effects of a low environmental concentration of potassium on neuromuscular irritability are increased by making the surrounding fluid more acid (Gellhorn 1928, Lehmann 1937).

The Rise in Bicarbonate

May I now invite your attention to the rise in serum-bicarbonate which accompanied potassium depletion in both our subjects, and disappeared when the depletion was repaired. Raised serum-bicarbonate in association with potassium depletion has been described clinically, in Cushing's syndrome (McQuarrie et al. 1937), and also after surgical operations (Eliel et al. 1950); with potassium therapy, the serum-bicarbonate level falls (Kepler et al. 1948). This raised bicarbonate has often been described as a "hypokalæmic metabolic alkalosis," but it is difficult to see why loss of a base from the body should lead to alkalosis. When a similar rise in serum-bicarbonate occurred in experimental potassium depletion, there was an obvious opportunity of analysing its mechanism against the background of available balance results. We can distinguish four mechanisms, not mutually exclusive, by which the rise in serum-bicarbonate could be produced:

(1) Respiratory acidosis.
(2) Renal conservation of base.
(3) Change in the acid-base composition of the diet.
(4) Transfer of base from cells to extracellular fluid, with replacement by hydrogen ions.

RESPIRATORY ACIDOSIS

In clinical potassium depletion, irregularity of respiration, with inadequate ventilation, has been described (Denton et al. 1951). Hypopnœa could in theory lead to a raised serum-bicarbonate, in which event the alveolar carbon-dioxide tension (pCO_2) would also be raised. This sequence was an unlikely one in our subjects, in view of the absence of general clinical symptoms, and we were able to show in one subject that the alveolar pCO_2 remained unchanged at the height of depletion. This indicates a calculated rise of plasma pH from 7·48 to 7·58, and establishes the presence of an alkalosis in extracellular fluid.

RENAL CONSERVATION OF BASE

Berliner et al. (1951) have shown that potassium and hydrogen ions compete for some component of the ion-exchange mechanism in the distal renal tubule, so that a diminished secretion of potassium might favour the elimination of hydrogen ions in the urine. The secretion over a period of a urine too acid for the body's metabolic needs would cause alkalosis, and they propose this as a mechanism for the "alkalosis" associated with clinical potassium depletion. There was in fact some evidence in our subjects that hydrogen-ion secretion was being favoured by diminished potassium secretion; for the output of (ammonia + titratable acidity) was negatively correlated with the potassium output, increasing even in the presence of E.C.F. alkalosis, which would be expected to decrease renal output of acid. This apparently disadvantageous change in renal behaviour was not, however, the main cause of the observed alkalosis, though it may have enhanced it in a minor degree; for the urine in the depletion periods was considerably less acid than in the control periods. It might still be argued that although the urine became less acid, it might nevertheless be prevented by the Berliner mechanism from becoming as alkaline as the changed metabolic needs of the body would dictate. We must now examine this possibility quantitatively.

CHANGE IN ACID-BASE COMPOSITION OF DIET

The conditions of the experiment introduce a complication into our treatment of this subject. Since potassium was almost entirely replaced by sodium in the depletion periods, we were forced to give supplements of sodium salts in the preliminary and after periods, if the sodium intake was to be constant. We did this with chloride alone in the first experiment, so that the chloride intake was considerably higher in the control and after periods than in the depletion period. In the second experiment, we modified this by giving chloride and bicarbonate in the proportions found in E.C.F., believing that such a mixture would be "biologically neutral." There was still, however, a substantial excess of chloride in the diet, in the control and after periods, so that in both experiments in the depletion period less fixed base (sodium plus potassium) was "covered" in the diet by chloride, and this might well favour alkalosis.

To examine this matter further, we have calculated the fixed base and chloride intake and output in the various periods. As the fixed acids other than chloride did not change in the diet, the difference between dietary fixed base and chloride is a measure of the alkalinising tendency of the diet, while the difference between output of fixed base and chloride indicates the extent to which the dietary change has been compensated by change in excretion. In subject 1, who had the sodium supplements entirely in the form of chloride, there was a very considerable excess of (fixed base minus chloride)

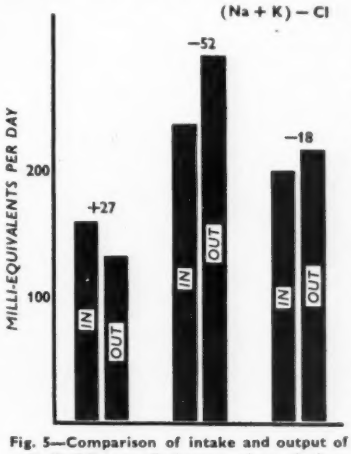

Fig. 5—Comparison of intake and output of "alkali" in preliminary, resin, and after-periods in subject 2. "Alkali" under the conditions of the experiment is given by Na + K − Cl.

in the depletion period, and this was only partially compensated by change in excretion ; so the dietary change must have contributed to the extracellular alkalosis. In subject 2, on the other hand, who had part of the sodium supplement as bicarbonate, the excretory change more than compensated for the dietary change, and the extracellular alkalosis cannot be attributed in any degree to the increased alkalinising action of the diet.

These deductions from the (fixed base minus chloride) in diet and excretion are perhaps more simply arrived at from comparison of the sodium and potassium balance. In subject 1 the positive balance of sodium was greater than the negative balance of potassium, indicating an increase in the total fixed base. On the other hand, in subject 2 potassium was lost to a greater extent than sodium was retained, so that the fixed base content of the body decreased. The extracellular alkalosis in subject 1 may thus have been partly caused by inadequate renal response to an alkalinising diet ; but in subject 2 this explanation seems inadmissible, and we are faced with an alkalosis in extracellular fluid, but with an actual fall in the body content of sodium and potassium of the order of 60 m.eq. This would seem to require that the extracellular alkalosis be balanced by an intracellular acidosis, a possibility which we must now discuss.

EXTRACELLULAR ALKALOSIS WITH INTRACELLULAR ACIDOSIS

The classical study of Darrow et al. (1948) showed that in potassium-depleted rats the rise in serum-bicarbonate was closely correlated with changes in intracellular composition, notably the entry of sodium into the cells. Further work by his group (Cooke et al. 1952) has now shown that this replacement of intracellular potassium loss by entry of sodium is incomplete, only about two-thirds of the potassium deficit being made good by sodium. Cooke et al. suggest that hydrogen ions pass from the extracellular fluid to within the cells during potassium depletion, leaving an extracellular alkalosis. This concept of an intracellular acidosis, caused by entry of hydrogen ions from the E.C.F., is supported by the observations of Gardner (1952) on the muscles of potassium-deficient rats. He found that when the extracellular bicarbonate was increased there was at the same time a fall in intracellular bicarbonate and carbon dioxide tension, and the calculated intracellular pH fell from a control value of $6{\cdot}98 \pm 0{\cdot}08$ to $6{\cdot}42 \pm 0{\cdot}05$.

Our own experiments did not include muscle biopsy, and so we can offer no proof of intracellular acidosis comparable in elegance to these results on animals. However, it is difficult to see what other mechanism could explain the extracellular alkalosis in the subject who showed a net loss of base from the body, with no shrinkage in total body-fluid. In both subjects the amount of sodium which left the cells during recovery was substantially less than the amount of potassium which went in, suggesting that during depletion there was a " K–Na gap " of the type which would favour, or even necessitate, a hydrogen-ion shift. The much greater loss of potassium than of phosphate from the cells would also suggest a fall in phosphate valency, such as would be promoted by the entry of hydrogen ions into the cells. All these points are consistent with the mechanism proposed, but do not of course prove it.

Therapeutic Implications

The evidence which I have so far presented suggests that acidosis increases the " penetration " of hypokalæmia as a cause of symptoms, and also that potassium depletion may be associated with an over-all acidosis even in the presence of a raised serum-bicarbonate. If these submissions are accepted, it would appear logical to treat clinical potassium depletion by potassium in combination with anions which are oxidised in the body, such as lactate, citrate, or acetate. These potassium salts are alkalinising in their effect. Leonsins (1951) has suggested a mixture containing potassium bicarbonate, acetate, and citrate, 1 g. of each to 8 ml. of water (2 teaspoonfuls). I have had both personal and clinical experience of this mixture ; it is much less nauseating than a comparable amount of potassium chloride, and the slightly alkaline taste can be disguised in fruit juice. Given four times a day, it supplies 116 m.eq. of potassium. When direct administration of potassium is contra-indicated by a high serum level, as in the early treatment of diabetic coma, the acidosis should still be treated with sodium lactate, as advocated, among others, by Nabarro et al. (1952b).

Potassium Depletion and Body-fluid

Let us now consider the alterations in body-fluid accompanying experimental depletion of potassium.

During the resin period, both subjects lost potassium, retained sodium and chloride, and showed no significant change in weight. Most of the potassium must have come from the cells, for the potassium loss was several times greater than the estimated initial extracellular potassium ; moreover, the concentration of extracellular potassium never fell below half the initial value. Some of the sodium may have gone into cells, but it is unlikely that chloride did so. Calculation of change in extracellular fluid volume from the chloride balance (Danowski et al. 1951) indicated increases of 3·0 and 1·9 litres in the two subjects. A fall in the hæmatocrit percentage, which was observed in both subjects, gives evidence of E.C.F. expansion, independent of balance calculations. In the recovery period, there was a considerable urinary loss of water and sodium, suggesting that the excess of E.C.F. was then being excreted ; at this time the hæmatocrit percentage rose again. The loss of cell fluid, which had been masked during potassium depletion by expansion of E.C.F., then became apparent by weight losses of 4·0 and 2·6 kg. in the two subjects. The changes in body-fluid distribution in one subject, calculated from the chloride and water balance, are shown in fig. 6. It is of interest that one of Fourman's subjects developed actual œdema of the legs and face, and œdema in association with potassium depletion has been observed clinically (Eliel et al. 1950).

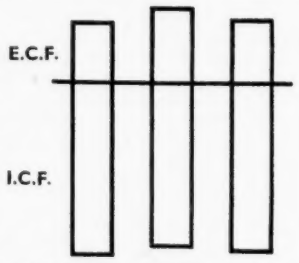

Fig. 6—Changes in amount and distribution of body-fluid in subject I

The calculated diminutions in intracellular fluid volume in our subjects agree fairly well with the amount of potassium known to be lost, and there is no evidence of a fall in the potassium concentration in the remaining I.C.F. The absence of any notable change in serum-sodium may be further evidence that the osmolarity of body-fluid, as opposed to its distribution, was not grossly altered. On the other hand, with the more severe depletion associated with acidosis, Fourman and Ainley-Walker (1952) found a loss of potassium which greatly exceeded the calculable volume change in I.C.F., and the concentration of potassium inside cells must have fallen. Severe potassium depletion in animals is likewise associated with a fall in the potassium concentration of muscle I.C.F. (Darrow et al. 1948, Cotlove et al. 1952). The rather limited data available suggest that with potassium, as with sodium, the first effect of depletion on body-fluid is a shrinkage of the relevant compartment of body-fluid, followed later by a fall in concentration ; but we cannot exclude the possibility that the rather

high sodium intake of our experiments may have contributed to E.C.F. expansion and I.C.F. shrinkage. Our own experience would suggest that the clinical effects of an isosmotic reduction of I.C.F. are negligible, in interesting contrast to the great thirst and the definite malaise evoked by a comparable reduction in I.C.F. volume caused by primary water depletion, and so associated with hypertonicity (Black, McCance, and Young 1944).

Making Good the Deficit

It has to be emphasised that the potassium depletion induced in our experiments was moderate, and the clinical deductions which can be drawn directly from them are correspondingly limited. They suggest rather strongly, however, that potassium depletion of the order of 250–300 m.eq. is not likely to be a direct cause of symptoms, except when associated with acidosis. This conclusion cannot necessarily be extrapolated to depletions of the order of 1000 m.eq., such as arise from large and sustained losses of alimentary secretions; but a short note by Aikawa and Felts (1952) claims that in cortisone-induced potassium depletion "reduction of less than 30% in exchangeable potassium was not accompanied by clinical symptoms or signs of deficiency." On the other hand, large deficits of an important intracellular base would be expected to influence cell function unfavourably, and there is evidence from work on animals that potassium depletion may interfere with enzyme activity (Boyer et al. 1942), with glycogenesis (Gardner et al. 1950), and with the utilisation of dietary protein (Cannon et al. 1952). Cardiac and renal lesions have been found in potassium-depleted rats (Follis et al. 1942, Darrow 1944), and similar lesions have been reported in patients (Keye 1952). The abnormal electrocardiogram associated with potassium depletion on the basis of experiments on animals has often been demonstrated in patients, together with irregularities of cardiac action; and there is some evidence that potassium depletion increases cardiac susceptibility to the action of digitalis (Lown et al. 1952).

Perhaps the most convincing evidence of the actual clinical value of repairing a potassium deficit is the study of Govan and Darrow (1946), quoted previously, in which mortality in the same outbreak of gastro-enteritis was much less in the infants given potassium supplements. The balance of evidence seems to me quite clearly to favour the giving of potassium whenever there is good clinical and biochemical evidence of potassium deficiency. There is no real difficulty when the patient can take potassium salts by mouth, and a good case can be made out for giving potassium by this route to any patient with adequate renal function who is losing potassium in stools or urine, and who is not vomiting. Unfortunately, many patients with potassium depletion are unable to take or retain oral potassium, and in them the risks of potassium depletion must be balanced against the risks of parenteral potassium administration. There seems little doubt that a large deficiency of potassium can cause unpleasant symptoms, and even contribute to a fatal issue, but a moderate potassium depletion can probably be disregarded until potassium salts can be given by mouth. The risk of parenteral potassium administration is quite definite, and the danger of cardiac arrest depends on the serum level of potassium; a rise to 10 m.eq. per litre may be fatal. How is it to be avoided?

A potassium depletion must always have been actually demonstrated in the individual patient before potassium infusion is even considered; it is not right to give potassium infusions to patients after operation, for example, just because other postoperative patients have been judged to have a potassium depletion. Not only is a demonstrable potassium deficiency the only valid reason for giving parenteral potassium; it also lessens the toxicity of potassium. Potassium-depleted rats show increased resistance to potassium poisoning (Miller and Darrow 1940, Muntwyler 1950). Human evidence on this point is difficult to obtain, but the increase in serum-potassium after an oral dose of potassium is less in a potassium-depleted subject than in the same subject when normal (Black and Milne 1952). I have heard of one patient with a severe potassium depletion who had a pint of 2% potassium chloride (270 m.eq. per litre) given intravenously in less than three hours, without ill effect. I can only say that if anyone wanted to do this to me, I should insist on a severe potassium depletion beforehand.

Sodium and potassium depletion occur more often together than separately, and the coexistence of sodium depletion adds to the risks of giving potassium parenterally. With sodium depletion, the serum level of potassium is often high, in spite of a cellular potassium deficit, and the patient is that much nearer to a toxic serum level. Moreover, the renal excretion of potassium is interfered with in these patients, and the E.C.F. volume is smaller, so that added potassium will cause a greater concentration change. Perhaps I may repeat the suggestion made in the first lecture, that sodium replacement should be carried to the point of restoring circulatory and renal efficiency, before potassium is given parenterally. In more practical terms, the blood-pressure should be normal, "shock" or peripheral circulatory failure should have been corrected, and the urine volume should be adequate.

Since potassium toxicity is a matter of extracellular fluid concentration, the rate of infusion and the potassium concentration of the infused fluid are of first importance. Potassium solutions, either chloride, phosphate, or lactate, for general use should not contain more than 40 m.eq. of potassium per litre, and should not be given more rapidly than a litre in three hours. I am aware that more concentrated solutions have been given more rapidly without mishap by physicians and surgeons specially interested in potassium metabolism; but they know the hazards, and the night-nurse in a general ward does not. My conservatism in this matter is dictated by the belief that potassium therapy, if necessary intravenously, can be of great value in selected cases; and I do not want to see it discredited by accidents in the "routine administration" of potassium to patients who are not materially depleted of potassium. Just as with sodium, treatment which is appropriate to one patient may be mischievous and even dangerous in another.

In the first lecture, I discussed the evidence needed to establish the presence of sodium depletion. The position with regard to potassium is more difficult, in that we cannot determine practicably the concentration of potassium in the main body-reservoir of potassium, the I.C.F., as we can do so easily with sodium in plasma, which represents extracellular fluid. We have therefore to rely more on indirect evidence, such as a history of potassium loss, or more precisely of some condition likely to cause potassium loss; muscle weakness and electrocardiographic changes; and indirect biochemical evidence. A low serum level of potassium almost always implies a general potassium depletion, especially in the fasting patient; but a normal serum-potassium does not exclude potassium deficiency. An unexplained rise in the alkali reserve should make one consider potassium depletion.

When the serum level of potassium is normal, but potassium loss is likely from the history, a decision on potassium depletion is difficult. One approach is to correct sodium depletion, and repeat the serum-potassium estimation, giving potassium if the level has fallen. Black and Milne (1952) found that the urinary excretion of potassium after a standard dose was related to the initial deficit of potassium in the body. Some preliminary observations on normal people suggest that a test for

potassium depletion could be worked out on these lines; but the normal and the diurnal variability of potassium excretion, and the effect of concurrent sodium depletion, present obvious difficulties. If these can be surmounted, such a test would be of value in the difficult group of patients with potassium depletion and a normal serum level of potassium.

The Pragmatic Sanction

As the sands run out towards the end of my attempt to portray body-fluid depletion, I enjoy a drowning man's vision of many sins of omission. I have scarcely mentioned the influence of hormones on electrolyte distribution; the effect of metabolic activity in promoting electrolyte shifts; and the special problems of infancy: yet all these are matters of the greatest importance. My extenuation must be that in covering so vast a field I have been driven to a base empiricism, in that I have had to set therapeutic recommendations on a rickety foundation of half-truths. My consolation is that the practical application of these methods, however insecurely founded they may be in theory, has often produced good results. This pragmatic sanction, if one may call it so, is no justification for complacency; for the therapeutic successes are considerably overshadowed, not indeed by utter failures, but by unsolved and challenging problems, such as the low-salt syndrome associated with œdema, or the effects of potassium loss on cellular function.

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DOSAGE OF ANTIBIOTICS

RELATION BETWEEN THE IN-VITRO AND IN-VIVO CONCENTRATIONS EFFECTIVE IN URINARY-TRACT INFECTIONS

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THE in-vitro bacteriostatic or bactericidal concentration of an antibiotic for any bacterial species can be readily ascertained in the laboratory. But, though the results are of recognised value in selecting the most suitable antibiotic for treatment, they are not used in deciding the dosage. This is largely because little is known about the concentration of the various antibiotics in the different tissues of the body during treatment. Reliance is placed instead on "standard" serum levels, and, according to these levels "standard" dosage schedules have been devised with reference to excretion-rates. The infecting micro-organisms are classified as sensitive or otherwise in relation to the expected serum levels of antibiotic resulting from these "standard" doses.

No attempt has yet been made to effect in vivo exactly the same concentration as is known to inhibit the micro-organism in vitro.

This paper records an attempt to correlate the therapeutic dosage of antibiotics, and the resulting in-vivo concentrations, with the results of in-vitro sensitivity estimations.

METHODS

Selection of Cases and Administration of Antibiotics

Infections of the urinary tract were selected for the trials because they are common, the collection of satisfactory specimens is relatively easy, and the cases are generally amenable to treatment. In uncomplicated cases the invading micro-organisms seem to be relatively accessible to antibiotics given systemically; and, compared with infections such as endocarditis, therapeutic results are more closely related to in-vitro sensitivity. The particular site at which the micro-organisms

TABLE I—ANALYSIS OF CASES

Case no.	Age (yr.)	Diagnosis	Infecting organism	Sensitivity of infecting organisms (μg. per ml.)					Antibiotic chosen	Dosage 6-hrly. (mg.)	Mean assay value of urine (μg. per ml.)	Clinical result of urinary condition	Bacteriological result of urinary condition
				P	S	C	A	T				After 1st course of antibiotic	
1	17	Pyelonephritis, mitral stenosis	*Bact. coli*	3	0·2	4·5	250	50	Streptomycin	1·0	0·33	Cure	Sterile
2	72	Pyelonephritis	*Bact. coli*	2·25	0·5	3·0	200	50	Chloramphenicol	60	2·5	Cure	Sterile
3	66	Pyelonephritis, respiratory infection	*Bact. coli*	30	0·3	4·5	250	25	Chloramphenicol	100	15	Cure	Sterile
4	71	Renal calculus, pleural effusion	*Bact. coli*	30	1·0	1·5	0·5	3	Streptomycin	7	2	Cure	Sterile
5	25	Acute pyelonephritis	Enterococcus, staphylococcus	3·0 0·05	7·5 0·05	4·0	0·25	3·5	Penicillin, streptomycin	4 0·2	8	Cure	Sterile
6	66	Prostatic obstruction, hypertrophic cystitis	Enterococcus	0·1	0·2	2·5	0·2	1·0	Penicillin	0·12	0·25	Cure of infection; referred for surgical treatment	Sterile
7	64	Malabsorption syndrome, pneumoconiosis, cystitis	Coliforms, enterococcus, *Staph. aureus*	3 3	0·5 125	8 13	250 250	50 50	Streptomycin, chloramphenicol	4 750	55	Cure	Removal of enteroccoci and all 3 coliforms; *Staph. aureus* persisted
8	52	Acute cystitis	*Bact. coli*	30	2·5	8·5	200	25	Streptomycin	12	6	Cure	Sterile
9	50	Pyelonephritis, congestive cardiac failure, hemiplegia	Streptococcus	30	25	6	0·04	1·25	Aureomycin	0·8	1	Symptomatic improvement	Sterile
10	59	Pyelonephritis, diabetes mellitus	Coliforms, enterococcus, actinomycete	3 3 0·012	5 25 0·02	8 5 1	7·5 0·25 1·25	2·5 1·25 50	Chloramphenicol	100	12	Symptomatic relief	Modified
11	56	Pyelonephritis, diverticulitis	*Bact. coli*	4	0·3	7·5	20	6	Streptomycin	22·5	3	Cure	Sterile
12	31	Pregnancy, pyelonephritis	*Bact. coli*	8	0·5	6	30	20	Streptomycin	3·13	2	Symptomatic cure	Sterile
13	25	Chronic pyelonephritis, renal failure	*Bact. coli*	30	25	3·0	200	25	Chloramphenicol, aureomycin	..	..	Urine clear, continuing renal failure	Sterile
14	30	Pyelonephritis	*Bact. coli*	3	0·6	1·0	0·25	1·25	Streptomycin	4	1·5	Cure	Sterile
15	62	Pyelonephritis	Enterococcus	0·05	6·0	1·0	0·2	0·125	Terramycin	2·4	2·5	Cure	Removal
16	25	Pregnancy, pyelonephritis	Enterococcus	1·5	17·5	12·0	0·5	2·0	Aureomycin	0·75	0·5	Cure	Sterile
17	64	Chronic pyelonephritis	*Bact. coli*	11	0·15	2·5	200	6	Streptomycin	16	1·5	Cure	Sterile

A, aureomycin; C, chloramphenicol; P, penicillin; S, streptomycin; T, terramycin.

TABLE II—FOLLOW-UP: CASES REINFECTED, RELAPSING, AND FAILURES

Case no.	Follow-up	Sensitivity of infecting organisms (μg. per ml.)					Second antibiotic chosen	Dosage 6-hrly. (mg.)	Mean assay value of urine (μg. per ml.)	Clinical result of urinary condition	Bacteriological result of urinary condition
		P	S	C	A	T				After 2nd course	
2	New infection: atypical *B. coli*	1·25	2·0	2·5	100	50	Chloramphenicol	112	10	Cure	Sterile
4	New infection: enterococci	2	> 20	3·5	> 25	50	Penicillin, chloramphenicol	6 75	10	Cure of infection	Sterile
5	New infection: *B. coli*	..	..	..	..	..	..	..	..	..	..
7	Persistence of staphylococci	25	20	30	0·5	2·5	Aureomycin	4	2	Asymptomatic	Sterile
9	New infection: staphylococci	0·3	20	4·0	> 250	5·0	Penicillin	0·2	<1·0	Cure	Sterile
10	Persistence	0·3	20	4·0	> 250	5·0	Penicillin, streptomycin, aureomycin	0·035 17·5 1·0	Not calculable	Symptomatic relief, diabetes controlled	Modification
12	Recurrence	..	0·5	7·5	25	25	Streptomycin	1·0	1·5	Cure	Sterile
15	New infection: proteus	..	0·6	4·0	100	50	Streptomycin	2·0	3·5	Asymptomatic	Sterile

A, aureomycin; C, chloramphenicol; P, penicillin; S, streptomycin; T, terramycin.

have to be attacked is usually not clear, but the criteria of infection and cure are definite and the same in all cases—namely, the presence or absence of clinical symptoms and signs, and the presence or absence of exudate and micro-organisms in the urine.

Of the 17 patients treated (tables I and II) 15 were females. The ages ranged from 17 to 72 (average 49).

Each case was considered individually when the sensitivity of the organism was known, and the antibiotic thought to be most suitable was administered six-hourly. The five-day period adopted at first was found to be unnecessarily long in some cases, and administration of the antibiotic was cut short twenty-four hours after a specimen of urine was apparently sterile.

Terramycin, chloramphenicol, and aureomycin were given by mouth, and penicillin and streptomycin by injection.

Bacteriological Examination of Urine

Catheter specimens of urine were examined in all the women, and mid-stream specimens in the men. The urine was examined at least twice before treatment was started. (In a few cases a longer period of observation without treatment was possible.) The urine was examined six hours after the first dose and daily thereafter. Follow-up specimens were examined fifteen days after therapy and again some months later.

Bacteriological examination of each specimen included microscopy of wet and stained preparations from the centrifuged deposit. All the specimens were examined microscopically and culturally within twenty minutes of sampling, and the number of organisms present was estimated by a plate-count of the fresh uncentrifuged specimen (Dick and Marwick 1953).

The effect of treatment on the number of organisms present in the urine and on the amount of exudate is shown in table III.

Determination of Sensitivity and Assay

The centrifuged deposit was used to inoculate plates for a screen sensitivity determination (Gould and Bowie 1952, Bowie and Gould 1952), and diagnostic plates were incubated aerobically and anaerobically. It was usually possible to identify the species of bacteria, and to determine their sensitivity to the antibiotics, within twenty-four hours; in most cases their sensitivity could be determined satisfactorily enough for calculation of the dose (see below). On subculture further biological identification was made if necessary, and confirmatory sensitivity tests were made with uniform standard inocula. The sensitivity of each organism to all the antibiotics used was determined at each isolation so as to discover whether there was any change of sensitivity to the antibiotic in use or to any of the others.

The supernatant urine was used for assay where appropriate. In all the cases the agar diffusion method (Heatley 1944) was carried out in parallel with the serial tube dilution method using both a standard test organism and the infecting pathogen of the particular case under examination (Mackie and McCartney 1950). In cases where the dosage of antibiotic was very small and the expected concentrations in the urine were about 1·0 μg. per ml. or less, a turbidimetric method of assay was also employed (McMahan 1944).

Calculation of Dose of Antibiotic

The excretion-rates of the different antibiotics vary widely. Almost all the penicillin administered can be recovered in the urine, whereas only a small percentage of biologically active chloramphenicol is recoverable (Glazko et al. 1950). Previous estimates of these excretion-rates have been made by different methods, and it seemed advisable to carry out a pilot experiment on a series of people to ascertain what proportion of the antibiotics we intended to use would be found in the urine with our particular methods of assay.

A group of students and a group of patients, with healthy renal tracts, were selected and given various amounts of antibiotics by different routes; the body-weight and the intake and output of water were measured,

TABLE III—EFFECT OF ANTIBIOTIC ON NUMBERS OF BACTERIA AND PRESENCE OF EXUDATE IN URINE

Case no.	No. of organisms per ml.					Exudate	
	Before therapy	From start of therapy (hr.)				Before first course	After first course
		6	30	78	126		
1	10^7	10^3	10^7	10^5	0	+ + +	−
2	10^7	10^6	10^6	0	0	+ + +	±
3	10^5	10^5	0	0	0	+ +	−
4	5×10^5	10^6	0	0	0	+ + +	+
5	10^4	0	0	0	..	+	−
6	5×10^5	10^6	0	0	0	+	−
7	10^5	10^5	10^5	10^4	0	+ + +	∓
8	5×10^6	10^5	10^3	0	0	+ +	−
9	5×10^4	5×10^4	10^4	5×10^5	0	+ + +	+
10	5×10^6	10^5	5×10^5	10^5	10^5	+	+ + +
11	5×10^7	0	0	0	..	+	−
12	5×10^7	..	10^5	0	0	+ +	−
13	10^5	10^3	10^3	..	..	+	−
14	5×10^4	10^3	0	0	0	+	−
15	10^5	5×10^5	0	10^4	10^7	+	+ +
16	2×10^6	10^5	0	0	0	+	−
17	10^5	0	0	0	0	+ +	−

and the concentration of the antibiotic in the serum and urine was estimated six hours after administration. The results (table IV) gave us a six-hourly percentage recovery-rate for each antibiotic. (The possible cumulative effect of repeated doses was ignored at this stage.) Since the in-vitro sensitivity was determined in each case by the same technique and with the same material, excretion-rates and expressions of sensitivity are correlated as far as possible. In calculating the dose of antibiotic for each patient we aimed at a mean antibiotic level in the urine equivalent to the level which inhibited the infecting organism in vitro. In view of the known variation in the excretion of antibiotics, confirmed by these experiments, and the known experimental error of our in-vitro tests (+25%), we decided to use a "dose-enhancing factor" to cover all variables, in the hope that this would ensure an antibiotic level in the urine at least as great as the in-vitro bactericidal concentration. The dose was calculated by multiplying the sensitivity expressed in μg. per ml. (table I) by the average six-hourly volume of urine passed during the period of observation; the product was multiplied by the reciprocal of the six-hourly excretion-rate of the antibiotic (table IV) to allow for the proportion of antibiotic not excreted in the urine. Finally this value was multiplied by our dose-enhancing factor.

The calculation of the dose of streptomycin in case 1 (table I) is given as an example. The sensitivity of the coliform organism in this case was 0·2 μg. per ml., the urinary output was 200 ml. in six hours, the excretion-rate of streptomycin was 20% (table IV), and the dose-enhancing factor adopted in this case was 5. The six-hourly dose of antibiotic was therefore

$$\left(0{\cdot}2 \times 200 \times \frac{100 \times 5}{20}\right) \mu g. = 1000 \mu g. \text{ or } 1 \text{ mg.}$$

TABLE IV—6-HOURLY EXCRETION OF ANTIBIOTIC

Antibiotic	Recovery of oral dose (%)		
	Students	Patients	Mean
Penicillin	66–92	70–84	80
Streptomycin ..	18–24	16–25	20
Chloramphenicol ..	2·6–4·6	1·2–4·8	3·4
Aureomycin ..	22–33	20–25	27
Terramycin ..	4·4–10·5	1·5–5·3	7·5

Table V shows the dose-enhancing factor used, and the factor actually obtained experimentally, in each case. The latter value was about half the estimate in most cases; hence the factor might well be reduced to 2·5.

RESULTS

The immediate result of treatment in 14 of the 17 cases (table I) was sterilisation of the urine. Of the remaining 3 patients case 7 had a staphylococcus originally present in small numbers, which remained after the first course of aureomycin; case 10's infection was of multiple species and long standing, in the presence of gross bladder disease making modification of the infection all that could be hoped for; and case 15 became infected with proteus during therapy, after removal of the original infecting species.

Of the 14 patients in whom the infection was cleared by the first course of antibiotic 5 became infected after therapy had stopped (table II), 4 with new infecting species and 1 with the original pathogen. Of these 5 patients 4 were successfully treated with a subsequent course of antibiotic, and the 5th passed out of our hands before completing a second course. The over-all result was that the urine in 14 of the original cases became sterile and remained sterile during the follow-up period, which varied from one to six months.

We think it of profound significance that in no case did antibiotic resistance develop in any of the original species either during therapy or after therapy, even when this was prolonged, as in case 12. Some species causing new infections did, however, show resistance to the antibiotic first exhibited.

TABLE V—RATIO OF URINE CONCENTRATION TO IN-VITRO INHIBITORY CONCENTRATION

Case no.	Calculated maximum ratio (dose-enhancement factor)	Experimental ratio
	1st course of antibiotic	
1	5	1·6
2	5	2·5
3	5	3
4	5	2
5	5	2·5
6	5	2·5
7	5	4
8	5	2·5
9	5	5
10	3·5	2
11	15	10
12	5	4
13	..	..
14	5	2·5
15	5	15
16	1	1
17	15	10
	2nd course of antibiotic	
2	10	4
4	5	3
7	5	3·5
9	5	Not calculable
10	5	Not calculable
12	10	4
15	10	6

Subcultures of every organism isolated in this series of cases were kept for various investigations, such as fuller biological identification, at a later date. Those organisms isolated on the first bacteriological examination in each case, and several isolated during treatment, have all proved capable of developing resistance in vitro to the antibiotic to which they had been exposed in vivo. Further, resistance to the antibiotics exhibited did develop in 3 of the cases in this series when the usually accepted "standard" doses were given outside these trials (table VI).

In the cases infected with a single bacterial species the use of a single antibiotic was effective in sterilising the urine. This was accompanied by clinical improvement or cure (cases 1, 3, 6, 8, 11, 13, 14, 16, and 17).

The use of two or more antibiotics simultaneously is indicated and is effective in urinary infections where more than one species of micro-organism is present and in-vitro tests indicate that no single agent will cover all the pathogens. A combination is also indicated and is effective when two antibiotics are observed to act synergically in vitro against a single bacterial species, and the use of the combination allows appreciably smaller quantities of one or both antibiotics to be exhibited. In case 13 it was found possible to use a twentieth of the usual dose of chloramphenicol by combining it with a very small dose of aureomycin.

TABLE VI—EFFECT OF STANDARD DOSES OF ANTIBIOTICS IN RAISING THE RESISTANCE OF ORGANISMS IN URINE OF PATIENTS IN THIS SERIES

Case no.	Sensitivity before antibiotic (μg. per ml.)					Therapy	Sensitivity after antibiotic (μg. per ml.)				
	P	S	C	A	T		P	S	C	A	T
4	30	1	1·5	0·5	3	Aureomycin 15 g., chloramphenicol 3 g.	30	1·0	15	250	50
13	30	1·3	3	50	25	Streptomycin 13 g., followed by chloramphenicol 13 g.	30	1000	2·5 20	25	25
19	30	1·5	2·5	10	10	Streptomycin, sulphonamide	30	100	2·5	10	10

A, aureomycin; C, chloramphenicol; P, penicillin; S, streptomycin; T, terramycin.

After the start of therapy the number of viable bacteria present in the urine decreased rapidly in most cases, especially those treated with streptomycin. This decrease was accompanied by disappearance or considerable reduction in the amount of exudate (table III).

DISCUSSION

Bacteriological sterilisation of the urine was effected in most of the cases in the present series by a concentration of antibiotic in vivo approximating to that required to inhibit the infecting species in vitro. The removal of the pathogens and the cessation of exudation were as rapid as would be expected if the usual therapeutic doses of antibiotic had been exhibited (Gould 1951), and the clinical response of the patients was at least as favourable (Cameron 1951).

The exhibition of antibiotics in a rational manner as described here has advantages which may be gained by the application of data obtained from the in-vitro tests at present made as a routine in hospital laboratories. The most suitable antibiotic available against a particular pathogen may be given in a dosage which will cause no toxic effects in the patient and no side-effects, such as gross upset of oral and intestinal flora. Except for chloramphenicol, this rational dose is very low indeed. It may be possible to prevent the development of resistance to antibiotics by exposing the organisms to in-vivo concentrations closely related to their in-vitro sensitivities.

Certain species and groups of micro-organisms appear particularly liable to become resistant to antibiotics, and those possessing the rapid one-step streptomycin pattern of resistance constitute a definite clinical problem.

All the individuals in a bacterial population are sensitive not to one particular concentration of a drug but rather to a range of concentration, which may be narrow or wide according to the antibiotic and species concerned. If this range of concentration is X–Y, only 1% of the bacterial population may be killed at X (bacteriostatic level) but 99·9% at Y (bactericidal level). It is the latter value which is generally given in sensitivity reports. Probably the potential resistant variants are to be found among the individuals which persist at this concentration, but these cells will not become resistant and dominant until a higher and critical concentration of antibiotic is reached. The aim in therapy should therefore be to subject the organism to a concentration that is related as closely as possible to Y, which is the in-vitro bactericidal level. This was the aim in the cases treated in the present series.

The organisms isolated before treatment, when grown in vitro, all showed a well-defined zone X–Y but could be induced to form resistant variants by exposure to concentrations of antibiotic greater than Y in each case. This was readily done by using streptomycin; it is well known that this antibiotic will induce resistant variants in culture and in the body during treatment. We think it highly significant that in the present series no antibiotic-resistant organisms were isolated either during or after treatment, although exposure lasted at least five days, sometimes longer.

We gained the impression that, when used in rational doses, streptomycin is no more likely to induce resistance than is any other antibiotic, and further that it is the most valuable antibiotic in most urinary-tract infections.

The principle behind the exhibition of antibiotics in this rational manner may well be applicable to the treatment of infection in other parts of the body. Advance along these lines will depend on further knowledge of the antibiotic levels attained in individual tissues under any particular scheme of dosage.

SUMMARY

The in-vitro sensitivity has been used in calculating a rational dosage of antibiotic in cases of infection of the urinary tract.

17 cases were treated with satisfactory clinical and bacteriological results.

No development of resistance to any of the antibiotics resulted from this therapy, and the number of resistant replacement strains encountered was less than when "standard" doses of antibiotics are exhibited.

If the dosage of antibiotic is based on the in-vitro sensitivity of the infecting micro-organism, it will often be much lower than the "standard" dosage. There is reason to suppose that if no more than the lowest effective dose is used, the infecting organism is unlikely to become resistant to the antibiotic.

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AN ANATOMICAL APPROACH TO POLIOMYELITIS

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FROM time to time theories of the pathology of poliomyelitis have been brought forward based on the conception that the pathways of the cerebrospinal fluid (C.S.F.) are intimately concerned in the transmission of the virus. Thus Burrows (1931) has carefully correlated the symptoms of poliomyelitis with the post-mortem appearances in a large number of cases. As a result of his findings he has regarded the perivascular spaces of the central nervous system as akin to the lymphatic vessels elsewhere in the body, and has suggested that their involvement in poliomyelitis is the direct cause of the damage to the nerve-cells.

Field and Brierley (1948a) have shown that the behaviour of particles introduced into the cranial subarachnoid space of animals may be similar to that of the virus of poliomyelitis in man. Theories as to the pathology of poliomyelitis based on this type of experimental work must of necessity assume that the virus behaves as an inert particle similar in all respects to the particles injected experimentally. This assumption is obviously a large one and must constantly be borne in mind before any conclusions about the pathology of nervous disease are based on the behaviour of injected particles. In the presence, however, of the great difficulties that beset the study of the artificially induced disease, there appears to be a place for this method of investigation in the search for a rational pathology and therapy for poliomyelitis.

The observations made in the present investigation were based on the fate of particles introduced into the subarachnoid space of the newborn rat, which animal has

not previously been used in an investigation of this kind. A suspension of particles can be introduced into the cranial subarachnoid space of the newborn rat with remarkable ease and little or no danger to its life. This has made possible for the first time the daily injection of an indicator into the cranial subarachnoid space of a laboratory animal over a long period, and consequently the introduction of a large amount of indicator relative to the size of the subarachnoid space.

MATERIALS AND METHODS

Newborn rats were anæsthetised with a mixture of chloroform and ether. After indian ink, colloidal silver, and colloidal silver iodide had been tried, 'Dag' colloidal carbon (Acheson Colloids) was found to be the most satisfactory indicator. On the day after birth each young rat was given an injection of 0·1 ml. of the indicator into the cranial subarachnoid space. After the injection the rat was returned to its mother. The injection was repeated daily, and the rats were killed at intervals up to three weeks.

The study of the pathways followed by the injected particles was facilitated by the dissection of the spinal cord and membranes under a binocular microscope, and by the preparation of whole cleared specimens and of sections of the rats stained by a variation of the Bielschowsky method and with hæmatoxylin and Van Gieson's stains.

OBSERVATIONS

In the region of the spinal canal the colloidal carbon collected in three main situations: (1) in the prevertebral lymph-glands, (2) in cuffs round the emerging nerve-roots, and (3) in the perivascular spaces of the spinal cord.

Prevertebral Lymph-glands

The lymph-glands on the posterior wall of the thorax and abdomen were clearly visible as black masses laden with colloidal carbon (fig. 1). This appearance was visible macroscopically within half an hour of the subarachnoid injection. In the thorax of rats allowed to survive for a while fine vessels, outlined by colloidal carbon, were seen running from the region of the nerve-roots to the lymph-glands.

Fig. 1—Posterior abdominal wall of rat aged 21 days showing carbon particles in prevertebral lymph-glands.

Cuffs Round Nerve-roots

These were clearly outlined by large deposits of colloidal carbon (fig. 2). Both the cranial and spinal nerves presented these *Tuschenmanchetten* (Ivanow 1927). The subarachnoid cuffs were especially well filled round the nerve-roots contributing to the brachial and lumbo-sacral plexuses. Accumulations of carbon particles also outlined the vessels on the surface of the spinal cord.

Fig. 2—Lower end of spinal cord of rat aged 21 days showing subarachnoid cul-de-sacs round anterior nerve-roots.

Perivascular Spaces of Spinal Cord

These contained large amounts of carbon particles (fig. 3), especially in the perivascular spaces surrounding the vessels supplying the anterior horn.

Summary

The path of particles introduced into the cranial subarachnoid space of the rat seems to be as follows. The particles pass rapidly down the subarachnoid space to the lower end of the spinal cord, being distributed freely through the C.S.F. They congregate in the subarachnoid cul-de-sacs surrounding the emerging nerve-roots and pass from these to the regional lymph-glands of the posterior abdominal wall. Later they tend to pass centripetally into the perivascular spaces of the spinal cord.

DISCUSSION

The experimental results briefly outlined above indicate that particles greater than the poliomyelitis virus can pass freely from the abdominal lymph-glands to the perivascular spaces of the spinal cord in intimate relation to the anterior-horn cells. Field and Brierley (1948b) have shown that the prevertebral glands are connected both with the lymphatics of the intestines and with the subarachnoid cul-de-sacs round the emerging nerve-roots. It therefore seems reasonable to infer that, in certain circumstances, ingested particles, especially if they are very small, might make their way from the intestines to the C.S.F. via the subarachnoid cul-de-sacs and thence to perivascular spaces of the spinal cord.

The nature and function of the perivascular spaces of the spinal cord are therefore matters of considerable importance. The flow of fluid in the perivascular spaces has been held by some workers to be from within outwards (Weed 1914, Schaltenbrand and Bailey 1927) and by others to be in the opposite direction (Mott 1910). The results obtained in the present investigation confirm

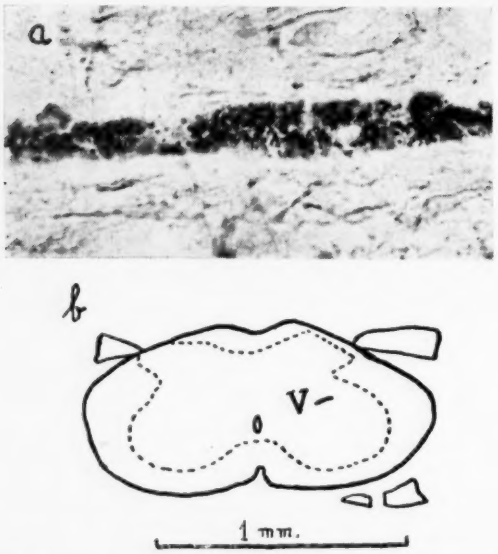

Fig. 3—Transverse section of spinal cord of rat aged 21 days : *a*, carbon particles in perivascular space round small blood-vessel (× 1250) ; *b*, position of blood-vessel (V) illustrated in *a*.

the finding of Brierley (1950) that, under physiological conditions, particles can penetrate into the perivascular spaces. To the perivascular spaces has been ascribed, by those workers who postulate a centrifugal direction of flow, the function of production or at least augmentation of the C.S.F. More rarely the opposite view is taken that absorption takes place along these channels. The results of the present experiments lend support to the view that these channels represent anatomical cul-de-sacs similar to those surrounding the emerging nerve-roots—backwaters in which there is a gentle eddy in both directions rather than a constant flow in one. Their main function may be to act as fluid cushions intervening between the nerve-cells and the contracting and expanding blood-vessels of the brain and spinal cord.

Burrows (1931) has regarded the pressure of the exudate in the perivascular spaces as the cause of the injury to and ultimate destruction of the anterior-horn cells in poliomyelitis. The presence of such an exudate may lower the cushioning properties of the perivascular spaces and thus expose the nerve-cells to the pressure changes produced by the passage of blood through the vessels. That the presence of an abnormal substance in the perivascular spaces round the vessels in the region of the anterior horn may damage the anterior-horn cells is shown by the work of Davis et al. (1930), who found that iodised oil injected through the cisterna magna into the subarachnoid space of dogs eventually destroyed the anterior-horn cells. The vulnerability of the anterior horn may be related to the rich vascularity of this region, for the greater the vascularity of a region of the cord the greater, presumably, is the area occupied by the perivascular spaces.

The various situations in which particles injected into the subarachnoid space can be found may have some bearing on the stages of poliomyelitis in man. The abdominal upset which often ushers in the illness may be due to the presence of the virus in the abdominal lymph-glands, whether it reaches these from the intestines or from some other locus of infection. The " meningitic " phase may be due to the presence of the virus in the subarachnoid space which it could reach along the pathway from lymph-gland to subarachnoid cul-de-sac. These subarachnoid cul-de-sacs occur along both cranial and spinal nerves and may collect exudate in poliomyelitis in the same way as they collected particles in the experiments on rats. The presence of an exudate in this situation might be responsible for the occurrence, in this phase, of symptoms such as neck rigidity and root pains due to irritation of the appropriate cranial and spinal nerves.

The third or " paralytic " stage is, as is well known, associated with the presence of exudate in the perivascular spaces of the spinal cord. It is interesting to note that particles injected into the subarachnoid space of rats were found within the subarachnoid cul-de-sacs round the emerging nerve-roots a few minutes later, but their appearance within the perivascular spaces was delayed until 24–48 hours after the initial injection (Brierley 1950). It is tempting to conclude that the filling of the perivascular spaces depends on the blockage of the pathway of escape of the particles from the C.S.F. via the subarachnoid cul-de-sacs into the prevertebral lymph-glands. The bearing which such a possibility has on this phase of the poliomyelitis cycle is self-evident.

THERAPY OF POLIOMYELITIS

The anatomical observations outlined here suggest that three stages can be distinguished in the fate of particles injected into the subarachnoid space of newborn rats : (1) the formation of subarachnoid cuffs round the emerging nerve-roots ; (2) the filling of the prevertebral lymph-glands ; and (3) the appearance of particles in the perivascular spaces of the cord. These stages appear to be so closely related to the phases of invasion by the virus in man that the question arises whether this fact can be used in treating poliomyelitis.

The cellular exudate found in the perivascular spaces of the spinal cord in poliomyelitis may be (1) a simple exudate from the blood-vessels, (2) due to a reaction in the perivascular spaces, or (3) an accumulation of cells derived from a generalised process in the subarachnoid space. If, as Burrows (1931) has suggested, the destruction of the anterior-horn cells is primarily due to mischief occurring in the perivascular spaces, then, irrespective of the origin of the exudate, the adequate drainage of the perivascular spaces appears to be of fundamental importance to the treatment of poliomyelitis.

It is perhaps significant in relation to this proposition that repeated lumbar puncture has been widely advocated as a method of treatment. The removal of C.S.F. by lumbar puncture is one of the three methods by which it is possible to achieve a circulation of the fluid in the perivascular spaces. The other methods by which a flow of the fluid in these spaces can be promoted are extreme exsanguination and the intravenous administration of hypertonic solutions. Whereas extreme exsanguination is clearly impracticable, perhaps a method of treatment based upon the intravenous administration of hypertonic solutions has potentialities which have yet to be realised.

The intravenous administration of a hypertonic solution promotes the circulation of the C.S.F. in the perivascular spaces. Hence the combination of this technique with the intrathecal injection of a therapeutic agent would enable that agent to reach the perivascular spaces.

Whichever theory concerning the transmission of the virus of poliomyelitis is held, it is clear that such a method of administration must bring a therapeutic agent into closer contact with the virus, whether it be in the neurone or in the perivascular spaces, than any of the methods of therapy which depend on the agent reaching the virus via the blood-stream.

The combination of the intravenous injection of hypertonic solutions with the intrathecal administration of antibiotic substances appears therefore to be

worthy of trial in the treatment of experimentally induced poliomyelitis.

SUMMARY

A new experimental technique has been used for studying the fate of particles injected into the subarachnoid space of newborn rats.

The implications which the results of these experiments have on the pathology and therapy of poliomyelitis are discussed.

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THE TREATMENT OF INTERMITTENT CLAUDICATION WITH VITAMIN E

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THE suggestion that administration of vitamin E is beneficial in peripheral arterial disease was originally made by Shute et al. (1948). Its use has been advised in the treatment both of angina pectoris and of intermittent claudication. In angina the earlier favourable claims (Vogelsang and Shute 1946, Vogelsang et al. 1947) were not confirmed by the more carefully controlled studies of later observers (Makinson et al. 1948, Donegan et al. 1949, Ravin and Katz 1949). On the other hand the administration of synthetic vitamin E in cases of intermittent claudication of moderate severity has been strongly advocated by Boyd et al. (1949), Ratcliffe (1949), and Boyd (1951), and as a result this drug is now widely prescribed.

If vitamin E acts by expediting the recanalisation of occluded arteries or the development of collateral arteries in cases of intermittent claudication, it is difficult to understand why it should not be equally effective in angina pectoris when this is due to occlusive coronary arterial disease. In a small series of cases of intermittent claudication Hamilton and Wilson (1952) found that synthetic vitamin E had no effect on exercise tolerance, which was measured at short intervals throughout the period of treatment.

In view of this conflict of evidence the action of vitamin E in intermittent claudication has been further investigated in a larger series of cases. On this occasion the natural product, as recommended by Shute et al. (1948), rather than the synthetic preparation, has been used.

TABLE I—SIMILARITY OF VITAMIN-E AND CONTROL GROUPS
(Table shows mean values with their standard errors for each group)

—	Vitamin E (20 cases). Mean ± S.E.	Control (21 cases). Mean ± S.E.
Age (years)	54·8 ± 1·8	55·9 ± 1·8
Duration of illness (years) ..	3·6 ± 0·5	3·3 ± 0·5
Exercise-tolerance tests:		
Average number of circuits ..	19·0 ± 1·6	18·1 ± 1·6
Average duration of pain after exercise (sec.)	42·0 ± 5·9	55·7 ± 5·8
Average time per circuit (sec.)	5·6 ± 0·2	6·5 ± 0·2

METHODS

41 patients have been studied. All had typical intermittent claudication of the calf muscles due to occlusive arterial disease. In only 1 patient was the arterial disease the result of thrombo-angiitis obliterans. In the remaining 40 cases the arterial lesion was assumed to be atheromatous. None of the patients had diabetes. Exercise-tolerance tests were made, so far as possible, at fortnightly intervals by walking over steps (Hamilton and Wilson 1952). The patient halted as soon as the pain in the legs developed. The number of circuits over the steps and the duration of the exercise were recorded, and the rate of walking was calculated. The duration of the pain after stopping was also measured. A full clinical examination was made before and after the course of treatment, and the patient's opinion about any change in his capacity to walk was ascertained.

Natural vitamin E was dispensed in gelatin-coated capsules, the specification for their preparation being that "the d. alpha tocopheryl acetate shall be prepared from vegetable oils and each capsule shall contain Type VI concentrate, equivalent to 75 mgm. d.l. tocopheryl acetate." Similar capsules were filled with arachis oil, and these control preparations were identical in size and colour with the vitamin-E capsules so that they could not be distinguished in any respect by either the investigators or the patients. During the twelve-week period of treatment two capsules were taken thrice daily. The dose of vitamin E was accordingly 450 I.U. per day.

Numbered sets of bottles containing either vitamin E or arachis oil were prepared in the Statistical Research Unit of the Medical Research Council; the order of administration of the two treatments was based upon a list randomly constructed in the unit and held there. After a preliminary period of observation of at least a month, the patient was allotted a number and took the similarly numbered capsules continuously for twelve weeks. The investigations were continued for a further month after the period of treatment. The nature of the treatment in individual cases was not revealed to the investigators until after the whole trial was completed.

COMPARABILITY OF GROUPS BEFORE TREATMENT

As the treatment allocated to each patient was determined randomly, a careful comparison of those receiving vitamin E and those receiving arachis oil is essential. This has been based on the observations made before treatment, and the results are shown in table I. The mean age and the mean duration of the illness are similar in both groups. For each patient the number of circuits walked before the onset of pain was recorded at each visit before treatment, and from these observations the

TABLE II—SIMILARITY OF VITAMIN-E AND CONTROL GROUPS BY BOYD CLASSIFICATIONS

Grade	Vitamin E	Control	Total
II	11	9	20
III	9	12	21
Total ..	20	21	41

TABLE III—COMPARISON OF VITAMIN-E AND CONTROL GROUPS ACCORDING TO PATIENT'S ASSESSMENT OF RESULT OF TREATMENT

Result	Vitamin E	Control	Total
Improved ..	8	6	14
No change ..	12	14	26
Deteriorated ..	0	1	1
Total ..	20	21	41

patient's individual average number of circuits was calculated. The means of these individual averages were then computed in the two groups, and they are shown in table I to be quite close. Similarly, for each patient the average duration of pain after stopping exercise was determined. The mean value was shorter in the vitamin-E group but not significantly so. The two groups do, however, differ significantly in the average time taken per circuit. The vitamin-E group take, on the average, 5·6 seconds per circuit, against 6·5 seconds for the control group; the difference of 0·9 has a standard error of 0·3, and such a difference, or a larger one, would be expected to occur purely by chance only about once in fifty times. Thus the random allocation has led to rather more of the initially brisker walkers being chosen for the vitamin-E than for the arachis-oil treatment. This means that any apparently marked effect of treatment in favour of vitamin E must be examined carefully to see whether it may have resulted from the initial disparity in walking speeds between the groups.

The distribution of cases, as classified by the method of Boyd et al. (1949), is shown in table II. There is no conspicuous difference between the groups, but again the vitamin-E group contains a slightly higher proportion (55%) of grade-II (less severe) cases than the control group (43%).

TABLE IV—INCREASE IN AVERAGE NUMBER OF CIRCUITS DURING WHOLE TREATMENT PERIOD COMPARED WITH PRE-TREATMENT PERIOD

Group	No. of cases	Average no. of circuits		Mean increase ± standard error
		Pre-treatment	During treatment	
Vitamin E ..	20	19·02	20·66	1·64 ± 0·86
Control ..	21	18·12	19·04	0·92 ± 0·84
			Difference	0·72 ± 1·20

RESULTS OF TREATMENT

Various measures of the improvement shown by the two groups during or after the period of treatment are summarised in tables III–VII. The patients' own assessments of the effect of treatment are tabulated in table III. There is clearly no appreciable difference between the two groups. These subjective assessments of the patients are more optimistic than the objective ones presented in the following tables. Throughout the period of treatment the observers could not distinguish between patients given vitamin E and those given arachis oil either by the patients' statements or by clinical examination.

For each patient the average number of circuits walked in the pre-treatment period (the measure used in table I) was subtracted from the average number walked during the whole of the treatment period. This difference provides a measure of the patient's improvement in exercise tolerance during the treatment period. Table IV shows the mean increase that took place in each of the groups, with its standard error. It will be seen that in neither group was there any substantial improvement in performance. The vitamin-E group shows a slightly greater increase (0·72 circuits) compared with the control group, but the difference is not significant.

Very similar results are shown in table V, where the pre-treatment averages are contrasted with those prevailing during the last month of treatment. The vitamin-E group again shows a slight, but non-significant, improvement over the control group. The control group here was reduced to 19 patients because 2 of the 21 did not visit the clinic during this part of the treatment period.

The possibility that the treatment took effect after the conclusion of the three months' treatment is examined in table VI. Here, for each patient, the pre-treatment average number of circuits is subtracted from the average number achieved during the three months following the end of treatment. The post-treatment visits were rather irregular, but all the patients except 1 in each group had at least one visit during this period. Once again the effect shown is small, and there is no significant difference between the groups.

TABLE V—INCREASE IN AVERAGE NUMBER OF CIRCUITS DURING LAST MONTH OF TREATMENT COMPARED WITH PRE-TREATMENT PERIOD

Group	No. of cases	Average no. of circuits		Mean increase ± standard error
		Pre-treatment	Last month of treatment	
Vitamin E ..	20	19·02	20·86	1·84 ± 0·96
Control ..	19	17·81	19·03	1·22 ± 0·99
			Difference	0·62 ± 1·38

The duration of pain that was experienced by each patient after his exercise-tolerance test is analysed in table VII. The average duration experienced by the patient in the pre-treatment period (as used in table I) was subtracted from the corresponding average observed during the treatment period. The difference between these two values was then expressed as a percentage of the pre-treatment values to reveal the relative improvement (or deterioration) in the patient. For instance, in the pre-treatment period a patient may, on the average of his observations, have experienced pain for 40 seconds. During treatment his average duration may have become 30 seconds, and this is represented by an improvement of 10 seconds in 40 (25%). The means, over the two groups of these individual percentage changes are given in table VII. In the whole period of treatment the vitamin-E group shows a small and non-significant reduction of 9·7% in duration of pain, while the control group shows a small and non-significant increase of 8·3%. The difference between these two values (18%) has a standard error of 7·0% and is therefore technically significant.

It is essential to determine whether this significant result in favour of the vitamin-E group is due merely to the disparity between the groups which has been noted earlier. Analysis within the two groups shows that it was patients who took the longest time over a circuit in the pre-treatment period who tended also, on the average, to show subsequently the least improvement

TABLE VI—INCREASE IN AVERAGE NUMBER OF CIRCUITS DURING FIRST THREE MONTHS AFTER TREATMENT COMPARED WITH PRE-TREATMENT PERIOD

Group	No. of cases	Average no. of circuits		Mean increase ± standard error
		Pre-treatment	First three months after treatment	
Vitamin E ..	19	18·88	19·85	0·97 ± 1·01
Control ..	20	18·32	19·82	1·50 ± 0·99
			Difference	−0·53 ± 1·41

in their duration of pain—i.e., comparing the pre-treatment and treatment periods. Thus, for each extra second in the original time that a patient took per circuit there was, on the average, a 6·7% increase in the duration of pain observed during treatment (the regression coefficient of 6·7 has a S.E. of 3·2 and is therefore significant at the 0·05 level). It has already been shown (table I) that the vitamin-E group has a mean time per circuit of 5·6 seconds, compared with 6·5 seconds for the controls. This difference, which to two decimal places is 0·85 seconds, would alone be expected to cause a subsequent difference between the two groups in the percentage change in duration of pain—i.e., (0·85) (6·7) = 5·7%. The observed difference of 18·0% in table VII should therefore be reduced by 5·7 to give the correct value, 12·3%. This corrected value still favours the vitamin-E group, but it has a standard error of 7·2% and is thus not technically significant, although it is sufficiently nearly so to require further consideration.

These observed changes in the duration of pain during the course of treatment were also analysed in relation to the treatment schedule. Table VII shows that the relative improvement of the vitamin-E group, compared with the deterioration of the control group, was slightly more distinct in the first two months' treatment than later. The corrected difference of 15·5% just reaches significance at the 0·05 level. In the third month of treatment and in the post-treatment period the differences, on the other hand, are not significant. In both groups in the post-treatment period the changes from the pre-treatment level are quite small and unimpressive.

The rather small numbers of patients available in this trial may have led to moderate effects of vitamin-E

TABLE VII—CHANGE IN AVERAGE DURATION OF PAIN DURING AND AFTER TREATMENT AS PERCENTAGE OF PRE-TREATMENT AVERAGE

Period	No. of cases	Mean ± standard error		After correction for time/circuit	Regression of percentage increase in pain on time/circuit
0–12 weeks' treatment	20	Vit. E	−9·7 ± 5·0		
	21	Control	+8·3 ± 4·9		
		Difference	−18·0 ± 7·0	−12·3 ± 7·2	6·7 ± 3·1
0–8 weeks' treatment	20	Vit. E	−10·2 ± 5·4		
	21	Control	+11·7 ± 5·3		
		Difference	−21·9 ± 7·5	−15·5 ± 7·7	7·5 ± 3·3
8–12 weeks' treatment	20	Vit. E.	−10·0 ± 5·0		
	19	Control	+4·9 ± 5·1		
		Difference	−14·9 ± 7·1	−11·4 ± 7·6	4·4 ± 3·5
Post-treatment period	19	Vit. E	−8·5 ± 6·5		
	20	Control	+5·2 ± 6·3		
		Difference	−13·7 ± 9·1	−12·0 ± 9·9	1·9 ± 4·3

treatment not being detected, owing to the considerable variability between patients. It is therefore of some interest to record the probable upper and lower limits to the effects of vitamin-E treatment as revealed by these controlled observations. These points are "95% confidence limits," between which the true mean effect is likely to lie. They are obtained by taking the observed differences in means given in tables IV–VII, and adding to, or subtracting from, them "t" times the standard error. (The factor t is the 0·05 level of the t-distribution on N-2 degrees of freedom, where N is the total number of patients used in the comparison. For a comparison using all the patients, as in table IV, N = 41 and t = 2·02.) The odds are 19 to 1 that the two limits include the true mean value for the type of patient used in this trial. The limits are given in table VIII. Those for increases

TABLE VIII—95% CONFIDENCE LIMITS FOR MEAN EFFECTS OF VITAMIN E IN COMPARISON WITH CONTROLS

Comparison	Limits
Table IV—Average increase in circuits during treatment	− 1·7 to + 3·1 circuits
Table V—Average increase in circuits during last month of treatment	− 2·2 to + 3·4 circuits
Table VI—Average increase in circuits after treatment	− 3·4 to + 2·3 circuits
Table VII—Average change in duration of pain, as percentage of pre-treatment level	− 26·8% to + 2·3%

in exercise tolerance probably exaggerate the possible beneficial effect of vitamin E, owing to the original disparity of the groups. In the calculation of limits for the percentage change in duration of pain the corrected value of table VII has been used.

DISCUSSION

In determining the results of treatment reliance has been placed on the statements of the patients, the clinical examination of the lower limbs, and the performance of exercise-tolerance tests. Neither of the first two indicated that vitamin E was in any way superior to arachis oil. In the exercise-tolerance tests treatment produced no marked or technically significant difference between the two groups as regards the distance that could be walked before the onset of pain. The only difference of any substance found between the two groups was in the duration of pain after exercise. During the whole period of treatment this increased by + 8·3%, on the average, in the controls and decreased by − 9·7% in the vitamin-E group. The difference between the two figures was shown to be significant. The statistical analysis of the results also showed that the duration of pain after exercise tended to become significantly greater in the slow walkers in both treatment groups as the trial proceeded. These slow walkers were initially rather more numerous in the control group; and, if a correction is made for this discrepancy, the difference between the two groups is no longer technically significant, though it continues to favour slightly the patients on vitamin E.

From the clinical point of view, however, too much importance should not be attached to these results, because the assessment of the duration of a pain that gradually fades away is notoriously difficult, and there was considerable variability in these measurements even in the same patient. It will be noted that the changes from the pre-treatment values are small in each of the two groups, and they are of significance only because they are in opposite directions. A more detailed analysis of the results showed that the difference between the two groups was greatest during the first two months' treatment but was non-significant during the third month and the period immediately after treatment. This is the reverse of what might be expected if the changes were the result of vitamin-E therapy.

The results of this investigation have shown that the beneficial effect of vitamin E in the treatment of these cases of intermittent claudication was not appreciably greater than that of arachis oil, and the earlier favourable reports of Boyd et al. (1949) have not been confirmed. Our failure to demonstrate improvement could be due (1) to the methods of assessement being insufficiently exact, with the result that a real improvement was overlooked, or (2) to the wrong type of patient being treated. In our exercise-tolerance tests the patients walked over steps, whereas in Boyd's series they walked on the level, either along hospital corridors or on a moving platform. The two methods, however, are fundamentally similar because they both measure the amount of exercise required to produce pain. A true improvement is reflected in an increase in the amount of exercise that can be taken before the onset of pain and in a decrease

in the duration of pain in spite of the greater effort (Hamilton and Wilson 1952). If the treatment were beneficial, a definite improvement in the vitamin-E group over the controls should have been revealed by this method of performing exercise-tolerance tests.

Patients with intermittent claudication of all degrees of severity have been studied, though Boyd (1951) has stated that only the less seriously affected (his grades I and II) respond to vitamin E. With the more severe exercise of walking over steps the pain, once developed, persists in all patients, and with this test none fall into Boyd's grade I. Our grades II and III thus include several cases that would have fallen into lower groups if the tests had been performed by walking on the level. There is thus no doubt that the series contained in both control and treated groups many of the milder cases reputed to respond to vitamin E.

These observations and considerations indicate clearly that vitamin E is of no appreciable benefit to patients with intermittent claudication. The previous favourable reports have not included details of any adequate control studies. In investigations of intermittent claudication reliance has always to be placed on an end-point determined by the patient's assessment of his pain. It has previously been demonstrated that this may be modified by any action involving therapeutic suggestion. In these circumstances the trial of any drug must be most rigorously controlled. Frequent exercise-tolerance tests are essential before, during, and after the period of treatment, preferably at fortnightly intervals. Finally, the trial should be conducted on the "double blind" principle, and before any drug is claimed to be effective it must be shown to be so when both patient and observer are unaware of the nature of the treatment.

SUMMARY

The effect of natural vitamin E in intermittent claudication was investigated in 41 patients, divided at random into control and treatment groups. The controls received capsules containing arachis oil, and the treatment group received capsules identical in appearance but containing vitamin E. The daily dose was 450 I.U., the equivalent of 450 mg. of tocopherol, and was continued for twelve weeks.

Until the whole trial was completed the clinical observers (and the patients) were unaware of the treatment given in any particular case. The assessment of the effect of therapy was based on the patient's opinion, the clinical examination, and the results of exercise-tolerance tests.

No appreciable difference was found between the response of the two groups.

It is concluded that vitamin E is of no value in the treatment of intermittent claudication.

This investigation was made at the suggestion of the Medical Research Council, who arranged the supplies of vitamin E. We should like to thank Prof. G. W. Pickering and Prof. E. J. Wayne for helpful advice and criticism. We are grateful to them and to the physicians and surgeons of St. Mary's Hospital, London, and the Royal Infirmary, Sheffield, for access to patients under their care. We should also like to thank Dr. A. M. Adelstein for assistance in the statistical analysis.

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AUTOMATIC FRACTIONAL ANALYSIS OF EXPIRED AIR AS A CLINICAL TEST

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Roelsen (1939) demonstrated that in emphysematous patients, more than in normal people, the composition of the expired air varied with the volume expired. His findings have been confirmed by Marshall, Bates, and Christie (1952), who interpret them as evidence of poor spatial correlation between ventilation and perfusion in emphysematous lungs. The possibility thus arises of using fractional analysis of expired air as a clinical test for emphysema. However, because of the labour entailed by the analysis of multiple samples of gas, the methods of the previous workers are hardly suitable for routine clinical use.

We describe here the use of a commercial analyser for continuous recording of the carbon dioxide content of respired air. The abnormal pattern is easily recognised, and, since repeated observations are conveniently made, the method lends itself to a study of the influence of relevant factors. A somewhat similar procedure, using a specially constructed instrument, was described by Dubois et al. (1952), who were, however, concerned with normal rather than pathological respiration.

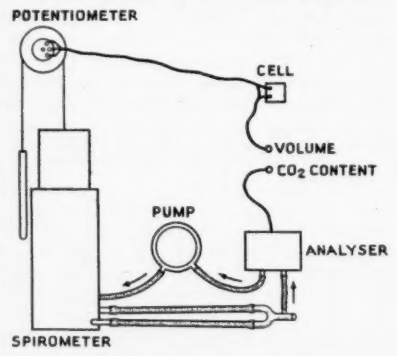


Fig. 1—Arrangement of spirometer and carbon dioxide analyser.

METHODS

The patient breathes into a Benedict spirometer fitted with a carbon dioxide absorber. Attached to the wheel of the spirometer is a potentiometer which gives an electrical record of the amount of air in the bell at any moment. A side tube to the mouthpiece is connected by a short length of rubber tubing to the analyser.* Air is drawn, at a rate of about 30 ml. per second, from the mouthpiece through the analyser by a small electric pump and is then returned to the spirometer bell. In this way the respired gases are continuously sampled without disturbing the registration of their volume. (fig. 1).

The analyser's electrical system uses amplitude modulation of a 6-cycle-per-sec. carrier, rectified and smoothed to give a response time of several seconds. As a much quicker response was required, the unrectified signal was taken out and rectified, without smoothing, by an external circuit. With this arrangement the response to sudden changes of gas mixture is complete in about one-third of a second.

Sometimes, in addition, intrathoracic pressure and trunk expansion were recorded by the method of Dornhorst and Leathart (1952).

* Infra Red Development Co. Ltd. Type S.C.

RESULTS

In all cases the carbon dioxide content of expired air rose abruptly from zero after clearance of the anatomical dead space. In what follows "expired air" will refer to that part of the breath after this abrupt rise has taken place.

Our results confirm those of the previous workers. In six normal persons the carbon dioxide content climbed

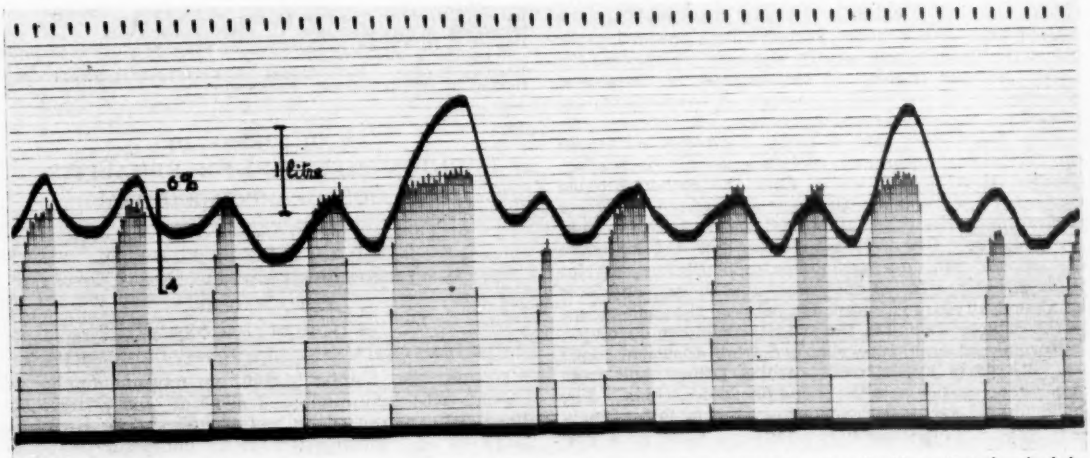


Fig. 2—Normal spirometric and carbon dioxide record: a large expiration does not entail an increase in carbon dioxide content of expired air.

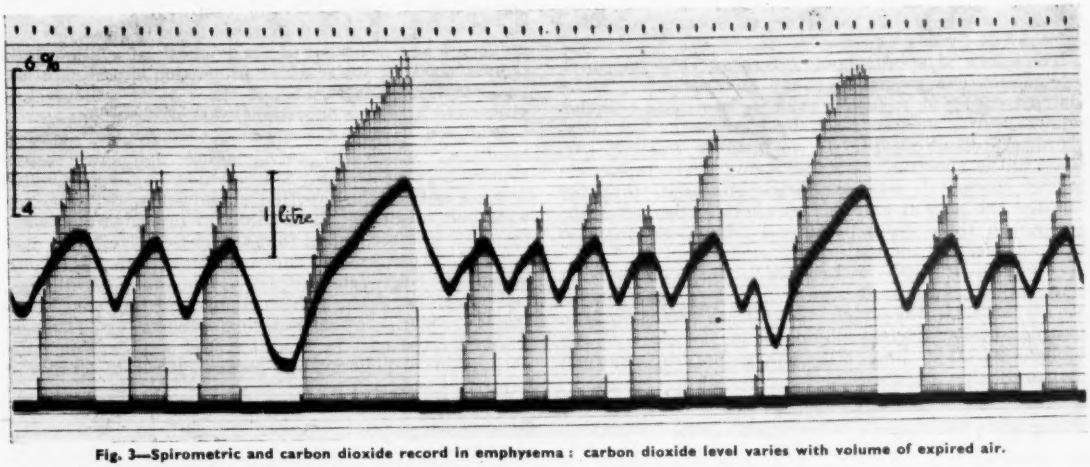
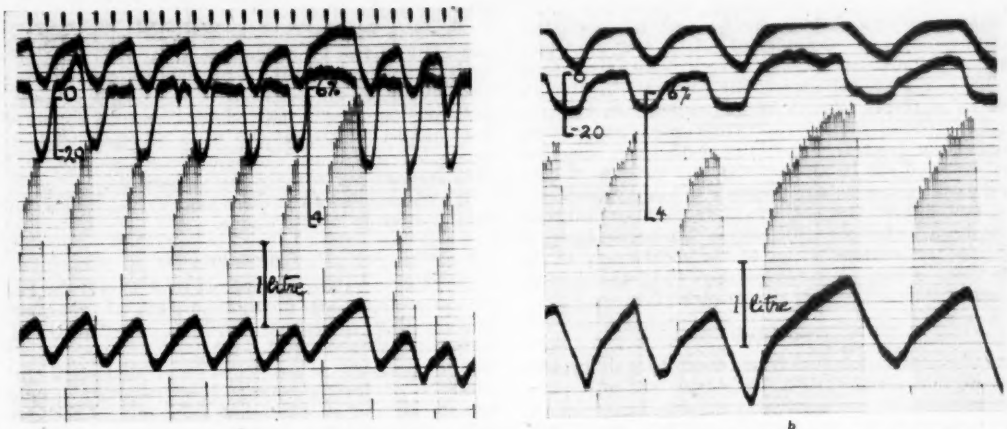


Fig. 3—Spirometric and carbon dioxide record in emphysema: carbon dioxide level varies with volume of expired air.



a b

Fig. 4—Records (from above down) trunk movement, intrathoracic pressure (mm. Hg), carbon dioxide content, and spirometer: *a*, during severe asthma (note large intrathoracic pressure swing); *b*, after spontaneous improvement. (Carbon dioxide record is still abnormal.)

about 0·5% during a forced expiration of 1–2 litres (fig. 2): in ten patients, considered on other grounds to have emphysema, the climb ranged from 2 to 4%, although the greatest volume expired was usually curtailed (fig. 3). The continuous records bring out further differences. Normally, as was also found by Dubois et al. (1952), the rate of climb is virtually independent of the rate of expiration; hence during a long expiration the record is straight and gently sloping. Moreover, the carbon dioxide content of the expired air is almost independent of its volume, though of course inversely related to the size of preceding breaths. In the emphysematous patient the rate of climb is directly related to the rate of expiration and, as this is usually decreasing, the record is curved, while, since the carbon dioxide content increases with the volume expired, a larger expiration carries the content well above that of adjoining breaths. One can appreciate how the patient's expired air will, during moderate ventilation, be far from representative of his mean aveolar air, and how an abnormally large discrepancy between the gas tensions in the expired air and in the arterial blood can develop.

Normal patterns were obtained from a patient, aged 73, with early hypertensive cardiac failure, and from two young patients with uncomplicated asthma. The latter finding agrees with the conclusions of Bates (1952) that ventilation-perfusion relationships were as a rule normal in asthma.

Patients with gross chest disease (bronchiectasis, &c.) but without overt emphysema gave patterns of intermediate climb (1–1·5%). The significance of these must await further experience.

The effect of a bronchodilator spray (1% isopropyladrenaline) was examined in all the patients. Many claimed easing of breathing, and in two cases bronchodilatation was demonstrated by changes in the intrathoracic pressure-record. In no instance was improvement in the abnormal carbon dioxide pattern produced: indeed the climb was sometimes increased, probably because the patient emptied his chest further after the spray. In three cases parenteral adrenaline was also without effect on the pattern.

One patient with asthma and early emphysema was studied during and after a period of exacerbation of his asthma. Although the intrathoracic pressure records showed a great difference in the state of the bronchioles, there was little change in his abnormal carbon dioxide pattern (fig. 4).

DISCUSSION

The procedure described is easy to apply with little disturbance even to severely dyspnœic patients. It yields evidence that is sometimes unequivocal, since patterns such as that shown in fig. 3 must imply disturbed ventilation-perfusion relationships. It is still uncertain if this type of disturbance occurs with significant frequency with normal expired-air patterns. Although this is in principle possible if all regions are emptied simultaneously, some sequential emptying is very likely on mechanical grounds. Further experience is therefore needed before it can be asserted that the test can exclude as well as demonstrate the presence of emphysema.

The stability of the pattern in face of spontaneous and induced changes in bronchiolar resistance is unexpected on current views of the mechanism of its production. However, its comparative stability enhances confidence in its diagnostic significance.

SUMMARY

A method of automatic registration of volume and fractional analysis of carbon dioxide content of expired air is described.

The occurrence of an abnormal pattern of expired-air composition with emphysema is confirmed.

The abnormal pattern persists with induced or spontaneous changes in bronchiolar constriction.

The procedure forms a practical clinical test for the presence of one important form of pulmonary dysfunction.

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AN OUTBREAK OF BENIGN MENINGO-ENCEPHALITIS
ISOLATION OF COXSACKIE VIRUS

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DURING the summer of 1951 an unusual number of patients with symptoms and signs of mild neurotropic illness were admitted to a Coventry hospital with a diagnosis of "meningitis" or of non-paralytic poliomyelitis. The admission to hospital during the same period of a few patients with paralytic poliomyelitis, the high incidence of this infection in recent years, and the knowledge that not all cases develop paralysis had induced a bias in favour of the diagnosis of non-paralytic poliomyelitis. Later the high proportion of non-paralytic patients raised doubts about the rôle of poliomyelitis virus, and virus investigations were undertaken.

Wallgren (1925) described an apparently identical condition, which he called acute epidemic aseptic meningitis, considering it to be distinct from poliomyelitis because not all the reported outbreaks were associated with poliomyelitis. As a result of investigations since then it is now recognised that this clinical syndrome may occur in other known and suspected virus infections, including benign lymphocytic choriomeningitis, mumps, and glandular fever, and in leptospiral infection (MacCallum 1949). Epidemiological studies by Thomson (1952) showed that in 1950, the first year in which the notification of poliomyelitis required separate returns of paralytic and non-paralytic cases, the proportion of non-paralytic cases was remarkably constant (20–40%). By contrast in 1951, between the 24th and 37th weeks, there was a sudden rise to over 50% in the notifications of non-paralytic forms of poliomyelitis, the increase being greatest in the Midlands.

The rôle of the Coxsackie group of viruses in the causation of this syndrome has been uncertain. Several workers (Melnick et al. 1949, Silverthorne et al. 1951) have reported the isolation of Coxsackie viruses from patients diagnosed as having non-paralytic poliomyelitis, but Smadel (1951), on the basis of serological studies, concluded that the Coxsackie viruses seemed to be of little importance in his group of patients.

We describe here the cases seen by us in 1951 and the results of virus investigations.

EPIDEMIOLOGY

In 1950 and 1951 (in contrast to 1947–49) the number of cases diagnosed in this hospital as non-paralytic poliomyelitis showed a marked preponderance over those with paralysis (table I).

Non-paralytic poliomyelitis was diagnosed in the presence of fever, meningeal or meningo-encephalitic symptoms, and an abnormal cell-count in the cerebrospinal fluid (C.S.F.), with or without an increase of protein, all occurring in the absence of paralysis or of

TABLE I—ADMISSIONS OF PARALYTIC AND NON-PARALYTIC CASES 1947–1951

Year	Paralytic cases	Non-paralytic cases	Percentage non-paralytic
1947	21	16	43·2
1948	5	5	50·0
1949	22	14	38·8
1950	27	79	74·5
1951	14	90	86·5

evidence indicating a different ætiology. 90 such cases were admitted in 1951, and 22 clinically similar cases (table II) had normal C.S.F. cell-counts, although 9 of these gave a C.S.F. protein content of 60–80 mg. per 100 ml. In all, 112 patients were admitted to hospital with a similar clinical picture and were drawn from a predominantly urban population living either in, or within ten miles of, Coventry, a city of over 250,000 inhabitants, which itself accounted for 100 of the cases.

The admission-rate rose in May, continued at a high level until the end of July, and then dropped sharply. The fall roughly corresponded with the advent of the local holiday week and of school holidays.

During the peak months 1 case each of tuberculous, pneumococcal, and *Hæmophilus influenzæ* meningitis were seen; on admission they were indistinguishable clinically from the more severe of the meningo-encephalitic cases.

Multiple cases in families were probably not uncommon—e.g., a girl, aged 11 years, admitted in June, had meningeal signs and a C.S.F. cell-count of 140 per c.mm., while about the same time all the four other children in the family, aged 3, 5, 7, and 12 years, were ill but nursed at home.

Children of school age accounted for 55% of cases; the youngest patient was aged 6 months and the oldest 49 years.

Judged by history and pyrexia the duration of illness was 3 days or less in 20%, 4–7 days in 54%, 8–10 days in 18%, and 11–14 days in 8% of cases.

GENERAL CLINICAL DESCRIPTION

The onset of illness was sudden, with pyrexia commonly between 101° and 103°F. In cases lasting three days or less, severe headache and signs of meningeal irritation developed immediately. In cases of longer duration it sometimes seemed possible from the history to distinguish a premeningeal phase with pyrexia and moderate headache, generally lasting one or two days; in such cases a remission of from a half-day to two or three days occurred between the phases.

A mild sore throat was an early symptom in 27 (22)* patients; faucial congestion was noted in about the same number but without exudate. Herpes labialis occurred in 5 (4) patients aged from 11 years to 40.

Vomiting (often repeated) occurred in 73 (60) patients but seldom persisted after admission to hospital; 6 (5) others had nausea only.

Backache occurred in 19 (12) patients, and general limb aches in 10 (7) patients. Other sharp ill-localised and intermittent pains, sometimes persisting for a day or two, were recorded as follows: chest and shoulder girdle 6 (5) patients, abdomen and pelvic girdle 13 (9) patients, limb or limbs 5 (4) patients, head and face 3 (2) patients. In all, only 41 (30) of the 112 (90) patients complained of one or other form of these "muscular" aches and pains.

Headache, frontal and occipital or both, was constant and often said by older patients to be the worst they had ever had. Spinal rigidity was also constant, in degrees varying from slight to severe, though never so severe as to cause head retraction or opisthotonos. Neck rigidity sometimes occurred without dorsolumbar rigidity, and less often the converse obtained. Kernig's sign was recorded 50 (38) times, and photophobia 6 (4) times. In 6 (5) cases the knee-jerks or the ankle-jerks were temporarily unobtainable; plantar responses were always flexor. 1 (1) female adult had retention of urine. There were no paræsthesiæ other than history of pins-and-needles at onset in 1 case.

In 26 patients there were, in addition to headache, other cerebral features (sometimes in combination)—irritability or delirium 12 (10) cases, drowsiness or stupor 7 (6) cases, convulsions 6 (6) cases (ages varying from 7 months to 11 years), and diplopia 3 (3) cases. These features and the meagre C.S.F. changes in some cases seemed to justify use of the term meningo-encephalitis for the whole series. The C.S.F. findings in these 26 cases matched those in the more purely meningeal cases. Encephalitic states could be very brief, as in a man who had returned to work during a remission and, feeling nauseated, visited the lavatory only to fall promptly into a stupor, from which he "woke up" about an hour later. Other signs of possible encephalitic origin were flushing and profuse perspiration in 3 (3) cases, and giddiness in 2 (1) cases; vomiting in some cases occurred with the nervous phase. In 21 (14) cases brief nystagmoid movements of doubtful significance were elicited (4 of these patients had mental changes). The 3 cases already mentioned as having diplopia had no other paretic manifestations, and it was felt unlikely that they were poliomyelitis. No strabismus was observed.

Treatment in all the cases was symptomatic only, and recovery was invariably rapid and without, so far as is known, any sequelæ.

C.S.F. FINDINGS

The C.S.F. was usually clear and under moderately increased pressure judged by rate of drip. In at least

TABLE II—ADMISSIONS OF PARALYTIC AND NON-PARALYTIC CASES 1951

Months in 1951	Paralytic cases	Originally classified non-paralytic cases	Additional non-paralytic cases (normal C.S.F. cell-count)
Jan.–April ..	2	7	1
May–Aug. ..	9	77	18
Sept.–Dec. ..	3	6	3
Total ..	14	90	22

1 case it was opalescent (cells 702 per c.mm., mainly lymphocytes). Cell-counts and examination of cell types and of the protein, chloride, and sugar contents were routine; culture was not usually done except where it was felt that tuberculosis had not been excluded, or where the C.S.F. was opalescent or turbid. In all the cases rapid recovery ensued without chemotherapy.

Abnormalities were found in cell-counts (limit of normal taken as 5 lymphocytes per c.mm.) and in protein contents (normal range taken as 20–40 mg. per 100 ml.), but the chloride and sugar values varied within normal limits. Abnormal cell-counts occurred in 90 cases and in all save 3 the cells were a mixture of polymorphs and lymphocytes; the 3 exceptions had counts of only 4 or 5 per c.mm., all the cells being polymorphs. The amount of protein was increased mostly to 50–100 mg. per 100 ml. in 39 cases, in 30 cases accompanying a pleocytosis, and in 9 others a normal cell-count. In 13 cases no abnormality was found, but 2 of these each had a sibling concurrently ill and having a C.S.F. pleocytosis.

In 26 out of 31 cases in which the first sample of C.S.F. gave normal cell and protein findings a second diagnostic lumbar puncture was done at an interval of from two days to about a week. 14 of the second specimens gave abnormal cell-counts ranging from 5 polymorphs per c.mm. to 335 cells per c.mm. (mainly lymphocytes); 4 others had a slight increase of protein (60–80 mg. per 100 ml.); and 8 still gave normal findings. It was queried whether trauma, hæmorrhage, or entry of air

*The figures in parentheses are cases with abnormal C.S.F. cell-counts.

TABLE III—SUMMARY OF ABNORMAL C.S.F. CELL-COUNTS

Cells per c.mm.	No. of cases	Polymorphs (P) predominant	Lymphocytes (L) predominant	P. & L. about equal
Up to 10	8	3	3	2
10–100	45	9	29	7
100–200	19	2	15	2
200–1000	16	5	10	1
1000–1500	2	1	1	0
Total ..	90	20	58	12

at the first lumbar puncture could be held responsible for these abnormalities. That any significant quantity of air entered the theca during lumbar puncture appeared unlikely, and bloodstaining seldom accompanied the taking of first specimens. Further, the mixture of normal and widely varying abnormal findings in the second specimens matched the findings in first specimens. Therefore it was felt that the abnormalities on second testing were on the whole attributable to the illness.

The 13 cases in which there were no abnormalities of the C.S.F., or were not present at the time of sampling, recall experience in poliomyelitis where normal C.S.F. findings may occur even in the nervous phase (Paul 1951); indeed a wide range of C.S.F. findings from normal to a lymphocytic or high polymorph pleocytosis—much as in this meningo-encephalitic series—has been reported (Martin and Elkington 1950).

The abnormal C.S.F. cell-counts are summarised in table III.

CASES IN WHICH VIRUS INVESTIGATIONS WERE MADE

CASE 1.—Female, aged 15, admitted on seventh day of disease:

C.S.F.: 10 polymorphs and 10 lymphocytes per c.mm.
Protein 40)
Sugar 61 } mg. per 100 ml.
Chlorides 740)

CASE 2.—Male, aged 14, admitted on second day of disease:

C.S.F.: 30 polymorphs, 34 lymphocytes, and 160 red cells per c.mm.
Protein 60)
Sugar 65 } mg. per 100 ml.
Chlorides 740)

CASE 3.—Female, aged 14, admitted on fifth day of disease:

C.S.F.: 10 polymorphs and 30 lymphocytes per c.mm.
Protein 40)
Sugar 62 } mg. per 100 ml.
Chlorides 720)

CASE 4.—Male, aged 25, admitted on fourth day of disease:

C.S.F.: (2 occasions) normal findings.

CASE 5.—Female, aged 7, admitted on fifth day of disease:

C.S.F.: 250 polymorphs and 20 lymphocytes per c.mm.
Protein 40)
Sugar 54 } mg. per 100 ml.
Chlorides 800)

CASE 6.—Male, aged 4, admitted on fourth day of disease, a typical case of paralytic poliomyelitis.

CASE 7.—Male, aged 12, admitted on third day of disease:

C.S.F.: 60 polymorphs and 700 lymphocytes per c.mm.
Protein 40)
Sugar 56 } mg. per 100 ml.
Chlorides 740)

CASE 8.—Male, aged 10, admitted with scarlet fever; four days after admission he had pyrexia 101°F, frontal headache, and neck rigidity:

C.S.F.: 20 polymorphs and 70 lymphocytes per c.mm.
Protein 40)
Sugar 50 } mg. per 100 ml.
Chlorides 720)

This was possibly a mild case of postinfective encephalitis, not included in the totals of meningo-encephalitis cases.

VIRUS INVESTIGATIONS

Specimens of serum obtained in the acute and convalescent stages of the illness, and specimens of stools obtained on about the same day as the first samples of serum, were received from the 8 patients already described. Details of the days, relative to the onset of illness, on which the sera were obtained are given in table IV. The methods used in the preparation of stool suspensions for virus isolation and in making the neutralisation tests in suckling mice have been previously described (Kenyon et al. 1952). The dilutions of serum refer to the initial dilutions before the addition of virus suspension.

Isolation of Coxsackie Virus

A strain of one of the Coxsackie group of viruses was isolated from 1 (case 1) of the 8 stools investigated. The stool had been obtained nine days after the onset of illness. Histologically the newly isolated strain of virus caused lesions in the fat pads and brain of suckling mice and belonged to the B group of viruses. By neutralisation tests it was found to be similar to the strain of virus isolated from the outbreak in a children's home in Coventry in 1951 (Kenyon et al. 1952), but complete identification was not achieved.

Isolation of Poliomyelitis Virus

As there was a possibility that the clinical condition resulted from infection by poliomyelitis virus, attempts at isolation were made by inoculation into rhesus monkeys of individual or pooled stool suspensions previously used in suckling mice. Each monkey was

TABLE IV—HUMAN SERUM NEUTRALISATION TESTS

Case no.	Age (yr.)	Days after onset of illness	Serum dilutions 1/1	1/10	1/50	1/250	1/1250	Saline control
1	15	9	(1) 0/6	5/5	—	—	—	10/10
		23	0/7	0/5	1/10	8/8	—	19/23
2	14	3	0/4	2/5	7/8	—	—	12/12
		21	0/5	1/4	9/12	—	—	13/14
3	14	7	1/7	0/6	7/7	—	—	12/12
		20	2/7	0/7	0/6	3/6	7/7	17/18
4	25	3	6/6	—	—	—	—	6/6
		21	7/7	—	—	—	—	6/6
5	7	1	1/7	2/5	6/7	—	—	16/16
		19	0/7	3/5	1/7	0/10	3/4	20/21
6	4	2	3/13	5/5	—	—	—	} 8/12
		18	4/13	5/5	—	—	—	
7	12	3	4/12	0/7	7/7	—	—	17/17
		19	0/12	2/6	2/7	2/10	4/4	23/24
8	10	5	5/12	7/7	—	—	—	12/12
		21	3/11	0/6	6/6	—	—	8/8

(1) This indicates the number of mice which died as a result of inoculation over the number of mice inoculated. Surviving mice were those alive when 3–4 weeks old.
The figures given represent accumulated inoculations.

given, under anæsthesia, 0·6 ml. of suspension intracerebrally and 1 ml. intranasally, the intranasal inoculation being repeated next day. Daily temperature records were kept for three weeks after inoculation.

No. 1 monkey, which received a pool of equal volumes of stool suspensions from cases 1 and 2, had a pyrexial reaction on the sixth and seventh days after inoculation, without the development of paralysis. Histological examination of the spinal cord removed twenty-eight days after inoculation showed no evidence of poliomyelitis.

No. 2 monkey, which received stool suspensions from case 6, had a pyrexial reaction on the eighth and ninth days after inoculation, with paralysis on the tenth day, when the spinal cord was removed. Histological examination confirmed the diagnosis of poliomyelitis.

No. 3 monkey, which received a pool of equal volumes of stool suspensions from cases 3, 5, and 7, showed no pyrexial reaction or evidence of infection. Histological examination of the spinal cord removed twenty-one days after inoculation showed no evidence of poliomyelitis.

No. 4 monkey, which received stool suspensions from case 6, showed no pyrexial reaction or evidence of infection. No histological examination was made.

The stool suspension from case 4 was not investigated in monkeys.

The stool suspension from case 6 was inoculated intracerebrally into adult mice. No paralysis was observed after two passages, each of thirty days' duration.

TABLE V—MONKEY-SERUM NEUTRALISATION TESTS

Monkey no.	Serum	Serum dilutions				Saline control
		1/1	1/10	1/50	1/250	
1	Pre-inoculation ..	16/16 (1)	8/8	—	—	5/5
	28 days post-inoculation	—	0/6	1/9	16/16	15/16
2	Pre-inoculation ..	4/5	—	—	—	3/3
	10 days post-inoculation	4/10	5/5	—	—	6/6
3	Pre-inoculation ..	9/9	—	—	—	8/8
	21 days post-inoculation	11/12	—	—	—	5/6

(1) See table IV.

SEROLOGICAL INVESTIGATIONS

Complement-fixation Tests

The specimens of serum from the 8 patients were negative when tested against lymphocytic choriomeningitis and mumps antigens. The leptospiral agglutination tests were also negative.

Neutralisation Tests

The newly isolated strain of Coxsackie virus was used in these tests as a dilution of mouse-tissue suspension which, after being mixed with an equal volume of serum, contained about 100 $L.D._{50}$ of virus.

In view of the increase in neutralising antibody titre against a strain of Coxsackie virus, found in sera from 4 patients, similar tests were made with sera from 3 of the inoculated monkeys (table V).

Monkey no. 1, inoculated with the stool suspension (case 1) containing the newly isolated strain of Coxsackie virus, had developed neutralising antibody against this virus. Its excreta were not examined for the presence of the virus. The sera from the 2 other monkeys showed no evidence of the development of a significant amount of neutralising antibody.

DISCUSSION

The admission to hospital of more than 100 patients with meningo-encephalitis, mainly within a comparatively short period during the summer of 1951, was unusual. A tentative diagnosis of non-paralytic poliomyelitis was encouraged by the simultaneous occurrence of cases of paralytic poliomyelitis. Later the disproportionately small number of patients with paralysis made this diagnosis less likely to be correct. In view of the benign nature of the illness it is probable that many more patients were treated at home.

The main features were a sudden onset, with pyrexia of variable duration up to two weeks and a biphasic pattern in some patients. There were severe headache, vomiting, cervical and spinal stiffness, occasional diplopia, and sometimes delirium or stupor. A positive Kernig's sign was not always obtained. The course of illness was uncomplicated, and recovery was complete. The C.S.F. in 90 cases showed a pleocytosis of 10–1000 cells per c.mm., with counts of 10–200 in most patients. Lymphocytes were the preponderant cells, but polymorphs sometimes predominated. Often the protein content was slightly increased. In about 10% of patients changes in the C.S.F. were noted only at the second time of testing, and the other patients, although clinically identical, showed no abnormalities.

Besides poliomyelitis, the clinical picture of mild neurotropic infection could have resulted from other infections—e.g., lymphocytic choriomeningitis, mumps, and leptospirosis—but the occurrence of so many cases distributed over a fairly wide area within a short time and without other distinguishing features rendered these infections unlikely for the group as a whole. Laboratory tests showed that sera from 8 patients were negative for lymphocytic choriomeningitis, mumps, and leptospirosis. Of stools from 7 patients which were investigated, a strain of poliomyelitis virus was isolated only from the patient with paralysis, an experience similar to that of Silverthorne et al. (1951). This has been found to be of the Leon type. A strain of Coxsackie virus was isolated from the stool of 1 patient out of 8 investigated, and it was found to be similar to the strains of Coxsackie virus isolated earlier in 1951 from an outbreak of febrile illness in a children's home near Coventry (Kenyon et al. 1952). In that outbreak strains were isolated from all 5 patients investigated, and in view of those findings the isolation of only one strain was initially thought to be a chance phenomenon unrelated to the illness under investigation. Further, no case of aseptic meningitis was observed during the outbreak in the children's home. Although our knowledge of these viruses is very incomplete, it has been found (Bury and Tobin 1952) that a single strain of Coxsackie virus may give rise to different clinical types of illness. Conversely, immunologically distinct strains of Coxsackie viruses may give rise to a similar clinical type of illness. Whether the excretion of virus differs with different illnesses or whether it occurs intermittently was not investigated. Subsequently it was demonstrated that sera from 7 out of 8 patients had neutralising antibody against this strain of virus, a point in support of its wide distribution throughout the Coventry area. During the course of illness no increase in neutralising antibody was found in 2 patients, 1 of whom had poliomyelitis. A slight increase occurred in case 8, who was admitted to hospital with scarlet fever and subsequently had mild encephalitis. A significant increase in antibody occurred in 4 patients, including case 1, from whom the strain of virus was isolated, and also in monkey no. 1. Sera from monkeys nos. 2 and 3 showed no significant amounts of neutralising antibody against this strain of Coxsackie virus.

In the absence of other known causes, and in accordance with practice, it may be accepted that, as a significant increase in neutralising antibody titre against a strain of Coxsackie virus occurred during the course of illness in 4 patients, this virus was a link in their infection. Of the remaining patients 1 had poliomyelitis and 1 had possibly a mild post-infective encephalitis. In 2 patients, 1 of whom had no changes in the C.S.F., a definite diagnosis was not made, but the possibility of infection by an unidentified organism has not been excluded.

It is hoped that the sera from the 8 patients will ultimately be tested for neutralising antibody against the three types of poliomyelitis virus.

Possibly some of the patients in this widespread occurrence of benign neurotropic illness were infected with a Coxsackie virus, but the problem remains whether or not the illness was, for the most part, provoked by a single ætiological agent, or whether there were several factors involved. Further investigation is essential before the ultimate rôle of the Coxsackie viruses and the part played by the poliomyelitis viruses are decided.

SUMMARY

112 cases admitted to hospital in 1951 with a benign meningeal or meningo-encephalitic illness, of whom 90 cases had an abnormal C.S.F. cell-count, are reviewed.

Virus investigation of specimens from 8 patients was undertaken. A strain of Coxsackie virus was isolated from 1 patient with mild meningo-encephalitis. In this patient and in 3 others increased neutralisation of this virus was observed in samples of serum obtained in the convalescent stage of illness. No increased neutralisation was observed in 3 patients, including 1 with paralysis. A strain of poliomyelitis virus was isolated only from the patient with paralysis.

Serological tests for lymphocytic choriomeningitis, mumps, and leptospirosis were negative.

Although the small number of virological investigations prohibits any general conclusion on the group as a whole, the possibility exists that a Coxsackie virus may

have caused a proportion of the benign meningo-encephalitic illnesses described.

We are indebted to Dr. F. O. MacCallum for advice and helpful criticism, and Dr. A. Beck, Lieut.-Colonel H. J. Bensted, Dr. C. L. Greenbury, Dr. R. E. Jones, and Dr. W. McC. Wilson for help in various stages of the investigations.

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AN UNUSUAL TYPE OF HERNIA

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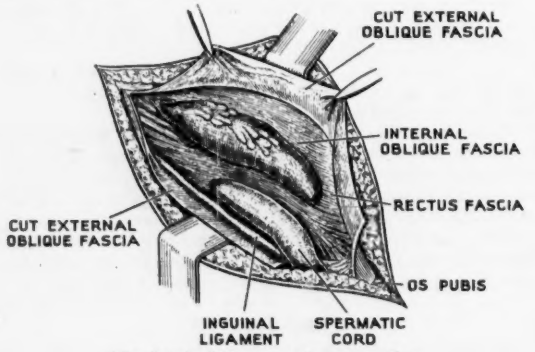
THE hernia described below was, to me at least, unique, for in a long experience of operative surgery I have seen nothing similar. Clinically it so much resembled the common type of indirect inguinal hernia that the routine procedure was adopted, and the exact relationships of the sac were not recognised until the area had been fully dissected.

A man, aged 42, gave a six months' history of a swelling in his right groin. This was said to be getting slightly larger and causing aching or dragging pain. He had had no previous operations.

On examination he was well built and muscular. In his right inguinal canal was a well-defined fusiform swelling which transmitted an expansile impulse on coughing and extended as far as the external ring. It was easily reducible.



The hernia fully exposed at operation.

An indirect inguinal hernia was diagnosed and the patient was in due course admitted to hospital for operation.

Operation.—When the inguinal canal was opened through a routine incision over it, the spermatic cord was seen to be normal. No sac was connected with the cord. The external ring was normal, the cremaster muscle was well developed, and the testis was normal. There was no sign of a direct hernia. This was puzzling in view of the clinical signs, which had been so clear at the first examination and had been confirmed by the surgical registrar when the patient was admitted. The external oblique muscle was therefore incised a little further, and retraction of the upper flap of the aponeurosis exposed a long thin process of fat lying above the cord, parallel with it and about $^1/_2$ in. from it (see figure). To trace this pad of fat back to its origin, the incision in the external oblique was extended another inch laterally, whereupon it was evident the process was issuing through a gap in the internal oblique muscle at a point about $1^1/_4$ in. lateral to, and $^3/_4$ in. above, the internal ring. The fatty process was then dissected and was found to contain a well-established peritoneal sac about 3 in. long and $^1/_2$ in. in diameter at its widest point. The opening in the internal oblique muscle was oval, about $^1/_2 \times ^1/_4$ in., with fibrosed and thickened edges. The sac contained omentum. Repair was effected by removal of the sac, freshening the edges of the gap in the internal oblique muscle, and suturing with floss silk. Further reinforcement was obtained by overlapping the aponeurosis of the external oblique muscle. The result of the repair has so far (twenty months after operation) been good.

It is a little difficult to determine why such a hernia should appear, unless it were due to a congenital defect in the internal oblique muscle; but, if this were so it is also difficult to understand why no hernia should have developed until after more than forty years of life. There was no history of sudden strain or violence which might have torn fibres of the internal oblique muscle. The only other suggestion I offer is that it was a traction hernia caused by a pad of properitoneal fat which insinuated itself between the muscle-fibres and pulled a process of peritoneum after it.

This hernia must really be classed as an interstitial hernia (Noonan 1950), but it is surely unusual for an interstitial hernia to present in the inguinal canal in such a way as to simulate an indirect inguinal hernia. The diagnosis of interstitial hernia is always difficult, particularly when it is immediately properitoneal—i.e., deep to the transversalis muscle—and, in fact, strangulation takes place in many cases before the diagnosis is evident.

It would be interesting to know whether any similar case has been observed.

REFERENCE

Noonan, T. J. (1950) *Lancet*, ii, 849.

New Inventions

A PROTECTIVE HOOD FOR LABORATORY BURNERS

THIS device is designed to prevent the scattering of infective material from wire loops when these are flamed. It consists of three detachable parts, and can be made in a moderately well-equipped workshop.

It was found, during experiments with different designs, that the main problem was to allow adequate ventilation without permitting the escape of infective material. If insufficient air were admitted, the enclosed bunsen flame would lose its normal size and shape; and, unless the alternative exit were large enough, hot air would escape through the slit cut for insertion of the loop, burning the operator's hand. Both these difficulties were overcome by baffled ventilation holes in the top and base as illustrated.

The base, which is supported by a tripod, consists of a rimmed metal disc with a ring of small holes at the periphery. To prevent any escape through them of infective material, they are guarded above by a flat baffle ring. A central hole admits the burner and fits

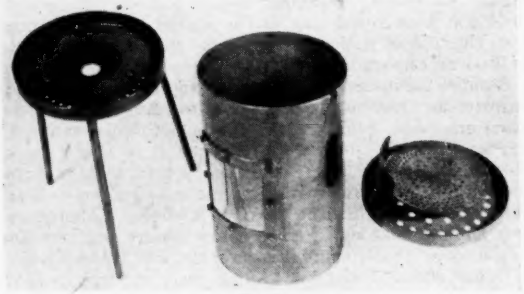


Fig. 1.

closely round it The steel cylindrical part has a mica window, so that the loop is visible while being flamed. The metal window-frame is bolted to the cylinder and can easily be removed to allow the mica to be replaced. A slit 1·5 × 4·5 cm. admits the loop for flaming. The top consists of a larger rimmed metal plate enclosing the cylinder, and a smaller one, 2 cm. below, enclosed by it; both have numerous ventilation holes, and the lower plate baffles the holes in the upper. Extending down 4 cm. from the upper plate is a small vertical baffle which helps to prevent the flame from escaping through the slit; when the apparatus is assembled, this baffle lies immediately within the slit, overlapping it slightly.

Fig. 2.

The apparatus does not get uncomfortably hot in use if the pilot lever of the burner is turned down whenever the flame is not required. It is quite stable on the bench. The metal used is mild steel.

We are grateful to Mr. E. V. F. Pittock for the photographs.

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Reviews of Books

Rose and Carless' Manual of Surgery

for Students and Practitioners. 18th ed. Editor: Sir CECIL WAKELEY, BT., K.B.E., C.B., LL.D., M.CH., D.SC., F.A.C.S., president of the Royal College of Surgeons of England. 2 vols. London: Baillière, Tindall, & Cox. 1952. Pp. 1471. 63*s*.

IT is nearly ten years since the last edition of "Rose and Carless" appeared. In all its long history this is perhaps the most notable edition, for the book has been transformed and almost entirely rewritten. In accord with modern trends the special sections on pathology and bacteriology have been discarded, and collaborators have been brought in to deal authoritatively with the various divisions of surgery which have become specialties. The result is a textbook which reflects accurately the best modern English practice. The editor has been happy in his selection of authors. There is an evenness in presentation rarely found in multiple-author books.

One of the greatest difficulties in compiling a textbook for the undergraduate is to decide how much knowledge he can be reasonably expected to acquire: it is very easy for a specialist's judgment to err on the side of demanding more than the average student should be asked to pick up in the crowded years before qualification. This is a large book, and contains a formidable and rather frightening amount of knowledge for the man beginning his clinical work. But the alarm the student may feel when confronted with these two volumes will be lessened when he really dives into them; for the matter is presented well, clearly, and attractively. It is all so exciting to the newcomer to clinical surgery that he will soon find that the task of reading through this large book is very much lighter than at first sight it appears. As the surgery of the special senses and anæsthesia are included the ordinary pass student will need no special books on these subjects. The outlook is completely modern, and the illustrations and general make-up are excellent.

Psychiatry and Medicine

An Introduction to Personalised Medicine. LESLIE A. OSBORN, M.D., professor of psychiatry and acting director, Wisconsin Psychiatric Institute, University of Wisconsin Medical School; director of mental hygiene, Wisconsin Department of Public Welfare. New York and London: McGraw-Hill. 1952. Pp. 494. 64*s*.

THIS book sets out "to depict in clinical perspective the close relationship that is developing between psychiatry and medicine. It deals particularly with personal and interpersonal factors as they influence health and illness." Professor Osborn has had experience in the fields of general practice, geriatrics, and psychiatry, but his chief interest has been in clinical teaching on the lines of this book; as head of the department of psychiatry in the University of Buffalo School of Medicine, he had ten years' experience of teaching medical and dental students and social workers. His aim is to make us more aware of the patient as a complete person rather than as an aggregate of tissues and organs, and to inculcate a habit of mind that assesses the individual's constantly changing attitudes to his environment, to society, and to health or illness.

The first part of the book deals with theoretical concepts; the teachings of Freud as modified by Adolf Meyer seem to underlie the author's approach. The second part is concerned with practical applications of theory in clinical study and therapy, and a short concluding section considers preventive psychiatric treatment. An appendix gives some useful outlines of psychiatric and neurological methods of clinical examination, though even here the characteristic warning that no "system" can replace consideration of the individual heads the chapter.

The word "personalised" in the subtitle does not do justice to the sort of medicine which Dr. Osborn evidently practises; nor does it, to British ears, hint at the common sense and warm humanity of these pages.

Cancer in General Practice

RONALD W. RAVEN, O.B.E., F.R.C.S., surgeon, Royal Cancer Hospital: P. E. THOMPSON HANCOCK, F.R.C.P., physician, Royal Cancer Hospital. London: Butterworth. 1952. Pp. 265. 30*s*.

THOUGH this book is intended for, and will be useful to, the general practitioner, its contents scarcely correspond to its title. "Cancer: a synopsis for general practitioners" would be more accurate. The chief physical facts about malignant growths occurring in the organs, systems, and regions of the body—incidence, pathology, spread, early and late symptoms, diagnostic procedures, treatment by surgery and irradiation, prognosis in terms of survival—are set out on an anatomical basis. There are illustrations—clinical, pathological, and radiographic—and a full bibliography, but no complete case-histories. Here and there a rule for investigation is laid down or a régime (in colostomy, for instance) is given in detail; but the outlook throughout is that of the surgeon, physician, or pathologist in a hospital investigating and treating disease processes, not that of the general practitioner essaying the often impossible task of early diagnosis and directing, sustaining, comforting, watching, and relieving the afflicted subject.

The problems raised by cancer in general practice are far more complex, formidable, and heartbreaking than is even hinted here. Some of them can be deduced from the grim facts given in the book, but few are directly faced and it is hard to believe that the authors have them clearly in mind. Perhaps even the implications of the advice given are not always appreciated. "Thus it is a rule to perform sigmoidoscopy on every patient who presents any abnormality of the anus or rectum. . . . No symptom, however trivial, should be overlooked and a complete examination should be made." Does this mean that every pruritus, superficial crack, pile tag, or anal hæmatoma must be sent to hospital for sigmoidoscopy? And if every abnormality *were* so referred would the complete examination indeed be made? Again, a thoughtful practitioner will surely require more evidence than is here adduced before urging a young woman with a stage-1 carcinoma of the breast to accept double oöphorectomy as a supplement to mastectomy.

Alcohol, Culture, and Society

CLARENCE H. PATRICK, professor of sociology, Wake Forest College, North Carolina. Durham, N.C.: Duke University Press. London: Cambridge University Press. 1952. Pp. 176. 22*s.* 6*d.*

THE sociologist is concerned with human culture in so far as it provides the means by which man, even in the most primitive societies, creates around himself a secondary world where he can look for the satisfaction of his biological needs: even the Bushman is not wholly dependent on his natural environment, as the animals are. From prehistoric times, alcohol has supplied a human cultural need; and it is with the use of alcohol, the underlying purposes of this, and the effects on both the individual and society, that Professor Patrick is dealing in this compact study.

From time immemorial alcohol has been a problem potent for good and ill. Greek and early Roman moralists disapproved of its use, but the Indo-Aryan tribes of India about 1000 B.C. believed that their god, Indra, was only capable of heroic deeds when intoxicated. England in the 17th and 18th centuries was notoriously intemperate; landlords of ginhouses used to hang signs out offering the customer enough gin to get dead drunk for twopence, and free straw to lie on. The Pilgrim Fathers were by no means teetotal, and from the 18th century onwards a taste for distilled liquors (obtainable from the West Indies as rum) rather than for wines and beer (obtainable only from the Old World) was making itself felt. Present-day drinking habits in the United States vary according to social class; in the working class and the upper class men and women drink together, whereas in the middle classes this is frowned upon.

The great influence of social *mores* on drinking patterns is discussed, and also the attempts being made by the U.S. liquor trade to influence these by skilful advertising campaigns.

Störungen der Fettresorption im frühen Säuglingsalter

FRITZ HAUSER, Privat-Dozent in the University of Basle. Basle and New York: S. Karger. 1953. Pp. 108. Sw. fr. 14.

THIS treatise from the pædiatric clinic of Basle University is obviously strongly influenced by the teachings of Verzár. After a discussion of the theories of fat absorption the author comes down heavily on the side of complete hydrolysis of triglycerides with subsequent resynthesis in the intestinal mucosal cell. Frazer's opposing theory of partial hydrolysis and of predominantly particulate absorption of unsplit fat is summarily rejected. It is a pity that Dr. Hauser gives us no references to what he describes as Verzár's recent unanswerable counter-arguments, and that he has followed Frazer's publications only up to 1946: an acquaintance with the more recent work would have prevented him from misinterpreting Frazer's ideas on the fate of long-chain fatty acids. The main part of the text deals with disturbances of fat absorption due to disease, but in many of the 21 cases described fat absorption was not studied at all, and their inclusion is puzzling. The last chapter contains some interesting points on the management of disturbed fat absorption in premature infants.

Wounds of the Extremities in Military Surgery

OSCAR P. HAMPTON, jun., M.D., F.A.C.S., instructor in clinical orthopedic surgery, Washington University. London: Henry Kimpton. 1951. Pp. 434. 70*s.*

Dr. Hampton's distinguished service with the American Army in the Mediterranean theatre of war forms the basis of his beautifully produced book. His first four chapters deal with such things as first-aid, the initial surgery of wounds in forward areas, and reparative surgery at base hospitals. He then discusses special injuries of bones, vessels, nerves, and joints, as well as amputations, burns, and regional injuries. There is a certain amount of overlapping, but the arrangement makes for easy reference.

With the main themes of Dr. Hampton's teaching his colleagues in the British Army would agree, but there are some points on which they may differ. Having admitted the advantages of the open-flap method for amputations in the forward area, and made a strong case for it, he advocates guillotine amputations. He advises the hip spica for the transport of fractured femurs—though of all the awkward, bedsore-making pieces of apparatus for loading into and out of ambulances, the hip spica takes first prize. Fortunately he gives a full page of diagrams showing the application of the Tobruk splint, which, though it may not hold the fragments quite still, permits of traction and of comparative comfort during transport, and does not necessitate the patient being turned sideways to get him through a door. The three pages on burns seem unduly brief for injuries which often present an exceedingly difficult problem.

Wounds of the limbs exceed in number all other wounds, and this lavishly illustrated book would be a good companion for any surgeon who had to return to war surgery. Moreover, the principles of traumatic surgery do not vary whether wounds are inflicted by design or accident, and many an industrial or road accident would be better handled if all surgeons had read this book.

The Measurement of Hearing

IRA J. HIRSH, Central Institute for the Deaf and Washington University, St. Louis, Missouri. New York and London: McGraw-Hill. 1952. Pp. 364. 51*s.*

THIS book is one of a large series of publications on psychological problems, and has been written for such diverse professional persons as the experimental psychologist, the clinical otologist, acoustic and communication engineers, and the physicist interested in sound. The lucid explanations of the principles of sound production and electro-acoustic equipment are helpful for the understanding of the various clinical procedures adopted in most clinics and laboratories today. Similes are used well to simplify technical points, and the meaning of such terms as difference limen, discrimination loss, recruitment, and social adequacy index is made clear. The psychological aspects are so practical and physiologically rational that they will appeal to both otologists and laymen. Mention might have been made, however, of such subjects as tone deafness, the appreciation of music, and the relative intelligibility of different languages to people with different degrees of deafness. The book should certainly be read by all those interested in acoustics. Many otologists would benefit from the clear and logical explanation of the science of audiology.

Rheumatic Diseases

Diagnosis and Treatment. EUGENE F. TRAUT, M.D., F.A.C.P., associate (Rush) clinical professor of medicine, University of Illinois. London: Henry Kimpton. 1952. Pp. 942. 150*s.*

Dr. Traut says that in the United States $7\frac{1}{2}$ million persons have "rheumatism," and 30 million have a deep personal concern in joint disease: of these, $1\frac{1}{2}$ million have degenerative joint disease. He has accordingly attempted to assemble material on this subject which is accepted as factual by current authorities. He has tried "not to display unjustified enthusiasm and devote too much space to discussions of the exciting new endocrinologic therapy of rheumatic diseases"; and the rather disappointing result is that only half a dozen pages in this very large book are devoted to the actual treatment of rheumatoid arthritis with cortisone and A.C.T.H. He advocates the use of a stock vaccine made from a greening streptococcus of low virulence, which he regards as an indispensable part of his armamentarium. Of gold therapy he says: "it is questionable whether chrysotherapy for arthritis deserves extensive consideration"—an opinion that would not be generally accepted on this side of the Atlantic. The chapter on physical medicine follows current practice, and includes a number of simple and valuable exercises for the daily use of the patient; and the interesting chapter on the ocular manifestations of rheumatic disease is a welcome innovation. In the chapter on fibrositis Dr. Traut pays tribute to the pioneer contributions of the British, though the only British reference given is to a book published in 1919. Indeed, there are very few references to papers of non-American origin, which is a considerable weakness. This well-produced but expensive volume gives an interesting review of the beliefs of the author and his colleagues in Chicago, but does not present so wide or impartial a view of rheumatic diseases as do "Comroe" and other well-established American books on rheumatology.

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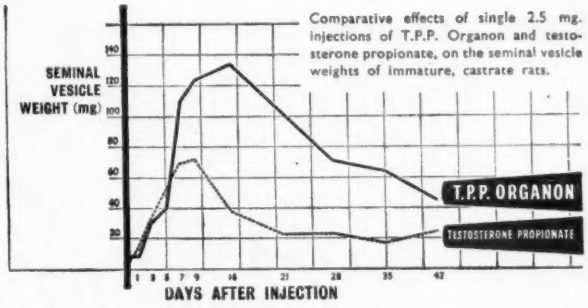

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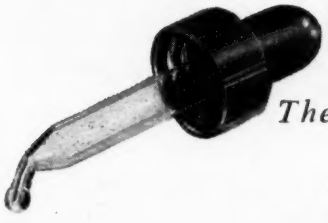

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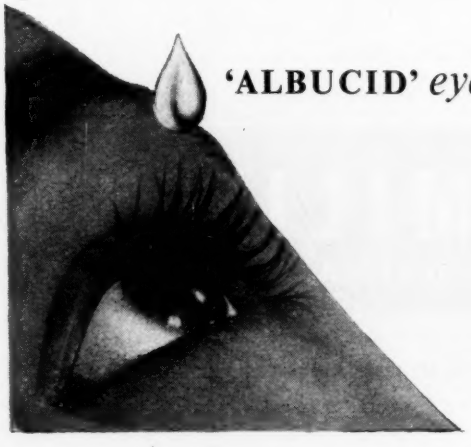

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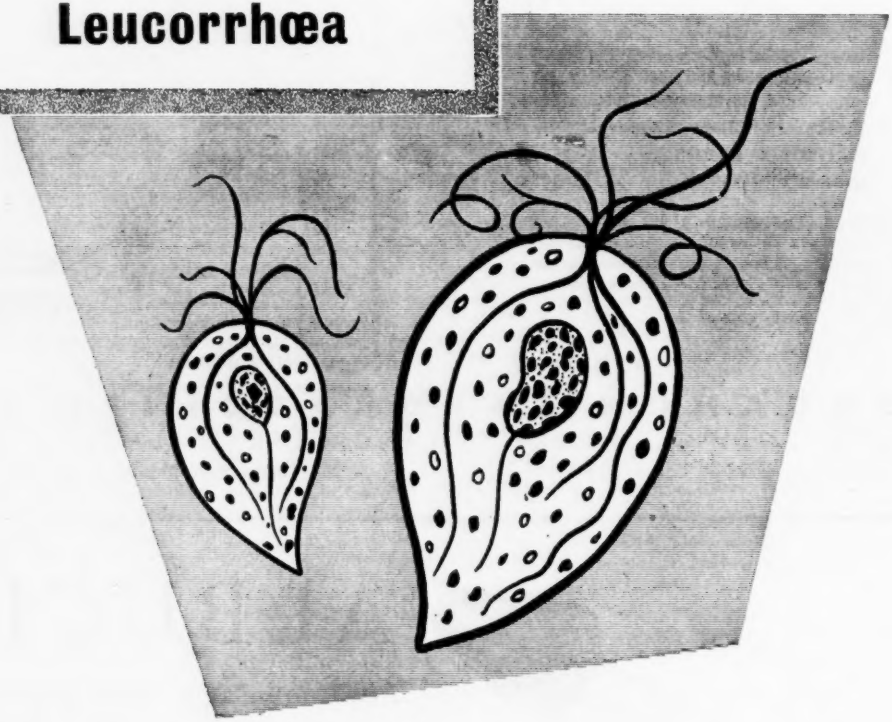

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THE LANCET

LONDON: SATURDAY, FEB. 21, 1953

Facts about Nursing

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In their welcome and unique report,[1] the Job Analysis Team of the Nuffield Provincial Hospitals Trust say that the modern tendency (clearly revealed in their survey) "is to regard 'the administration of medicines and the application of poultices' as the proper task of the skilled nurse, and to delegate the routine care of patients to less highly trained persons." This team, under the directorship of Mr. H. A. GODDARD, with Mrs. C. COLWELL as administrative assistant, Miss C. M. GRANT GLASS as nursing adviser, and Miss J. M. BLOMFIELD as leader of the field investigators, set out to give an exact and full account of the present duties of nurses in hospitals. The Working Party on the Recruitment and Training of Nurses,[2] it will be remembered, undertook a job analysis of the daily routine of 36 student nurses and 3 pupil midwives, and of a smaller number of sisters, staff nurses, assistant nurses, and nursing assistants, for the purpose of establishing the time spent on domestic duties, the amount of repetitive work in the nurse's training, and the extent of overlapping between various training courses. The Trust's team have approached the task more comprehensively and in a different way, by keeping entire wards under continuous observation over a period of time.

12 general hospitals which were also nurse-training schools were selected, 9 of them former voluntary hospitals and 3 former municipal hospitals. In situation they were scattered over England and Scotland, 4 serving rural, and 8 urban or industrial, populations; and they ranged in size from under 200 to 1500 beds. The block system of training operated in 6, the weekly study day in 1, and the remaining 5 maintained the old pattern which requires the student nurse to interrupt her ward work for lectures, and do her reading after work, in the evenings. Only 3 hospitals had introduced the three-shift system for student nurses; the remainder used the two-shift system with a spell of split duty during the day.

In these 12 hospitals the observers watched 26 wards on a minute-to-minute basis, noting everything that was done in them by all grades of staff (including orderlies, porters, and ward-maids), day or night, over a period of a week.

Two findings seem to us outstanding: almost three-quarters of the time spent on nursing duties in these wards was contributed by student nurses; and in most of these hospitals nursing was being done with inadequate equipment. The first point is perhaps less of a surprise than the second.

A contrast is evident between the medical, and particularly surgical, equipment in our hospitals and the equipment of the wards. Bedpan sterilisers have rarely been installed, which means that student nurses waste time daily in cleaning and disinfecting bedpans; as heated racks for the cleaned pans are equally scarce, students waste time and fuel daily by warming them with hot water before taking them to patients. Trolleys are often so scarce that it is impossible to keep them laid for any special purpose (such as blanket bathing), and time is therefore wasted in laying trolleys afresh for every purpose. The research team saw no bedpan trolleys at all, though in one ward the nurses had improvised them from linen containers. One hospital had provided a wire carrier for urinals. Only one bread-cutting machine was seen on a ward, and it was out of order; the hygienic idea of using sliced wrapped loaves does not seem to have penetrated to our hospitals. Three wards did their sterilising with a fish-kettle on a gas-ring, and two of them had no means of sterilising bowls other than by flaming with methylated spirit. Bedpans and wash-bowls were often exceedingly scarce, some wards having as few as 7 wash-bowls for 37 patients or 5 bedpans for 28 female patients; only three wards had more than 8 screens to a ward, and some had only 4, which meant that screens had often to be dragged or carried the whole length of the ward. None of the wards studied had substituted curtains for screens. A shortage of matches was the cause of many wasteful journeys to and fro with a taper.

It is customary just now to talk about economising our nursing-power: one simple way to do it would be to provide nurses with the tools of their trade in adequate quantity. How is it that matrons—masterful women in other respects—have failed to make themselves felt over this essential preliminary measure? And why have the medical staff—and especially surgeons, who are able campaigners for their own tools—not seen to it that their nursing teams are properly supplied?

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Nursing is not the only work done in a ward: in fact, only about 60% of the time of the staff is spent on it. Nearly a quarter goes on ward organisation, and about a sixth on domestic work. The observers found that domestic work was done very largely by domestic staff, and that in most cases the student nurse was not required to do an excessive amount of it. Everyone will be glad to know that this perennial blister has been pricked at last. On the other hand the training needs of student nurses were regularly subordinated to administrative necessity, and the amount of time spent on teaching them in the wards, the team say, was negligible. "The highest figure recorded was 11 hours in the week, and the lowest 7 minutes." These figures represent the sum

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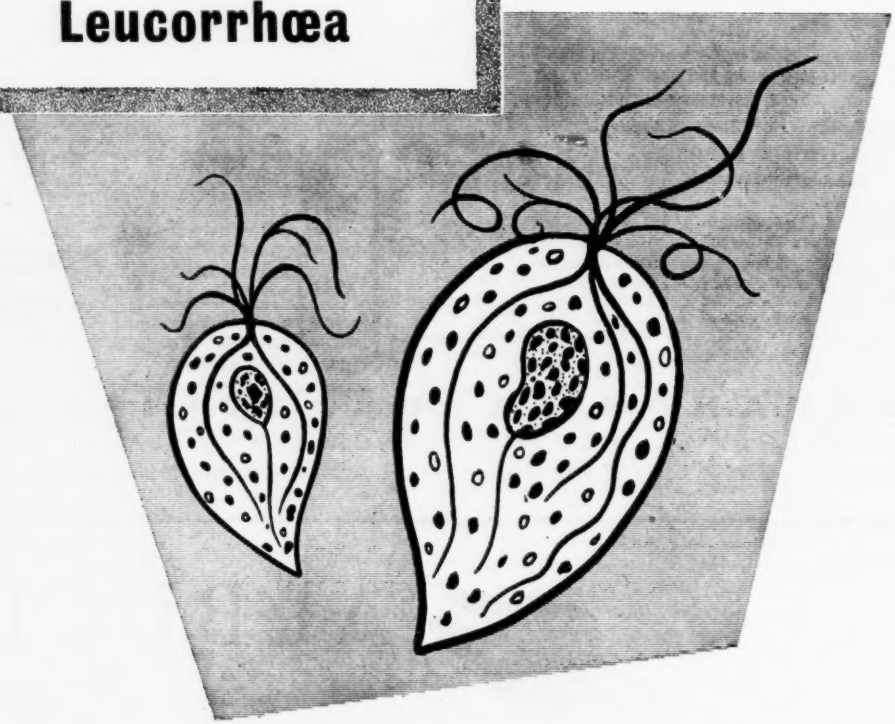
A new treatment for Leucorrhœa



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of all the periods spent by the trained staff in teaching, and was distributed, over the week, among all the students working in the ward—who might number anything from 8 to 2. Some sisters said that they made the giving and receiving of reports an occasion for explaining new cases to student nurses, but several said they did not explain new cases to students: they thought the information would probably "filter through."

The students receiving this diminutive instruction were doing 74% of all the nursing done in the wards. Nor were they engaged entirely on what the team agreed to call "basic" nursing procedures, meaning "those nursing duties having their origin in the physical needs of the patient" (they define these further in a list). Students also took some share in "technical" nursing, classed here as the care given as a result of the disease from which the patient is suffering; this includes such things as helping the medical staff with technical procedures, giving medicines, taking pulses and temperatures, doing dressings, giving injections, preparing patients for operations, checking drugs, stockmaking, testing urines, and looking after patients returned from operation. In one ward student nurses were responsible for taking blood-pressures. It is noteworthy that 72% of the total time spent on dressings was contributed by students. Students also have to take responsibility when the sister and staff nurse are both out of the ward together—as may happen when one of these seniors is on holiday. On night duty a student nurse is regularly left alone in charge of a ward while her companion is taking a meal. There can be little opportunity, the report says, for trained staff to supervise the work done by student nurses (for instance, in the dressing of wounds) and virtually none for giving practical instruction. No doubt the student is taught the theory of wound dressing by the sister tutor, but on the job she has to pick up her practical technique from her seniors in training. This recalls the monitoring system of the old national schools, where a child who had got his letters taught them to a group of smaller ones. It is a useful makeshift when teachers are scarce; but it cannot be classed as efficient training.

The student nurse is so little of a student and so much of a nurse for the same reason that the ward-sister is so little of a nurse and so much of a clerk. Besides having to attend any doctor at any time, and for whatever purpose, he may choose to visit the ward, the ward-sister also has to do a great amount of form-filling, report-writing, telephoning, and stock counting—all important duties from the administrative standpoint, but emphatically not nursing. In short, as the report says, the end-result of nurse training in the hospital service is not nursing but administration. Only 16% of the time spent on nursing in these wards was contributed by State-registered nurses, and for a considerable part of the day, when the staff nurse was off duty, the sister was usually the only fully trained nurse on the ward, and vice versa.

Matters would be easier to arrange, no doubt, but for the inflexible obstacle of the patient and his needs. He must be wakened, washed, eased, and fed—all, by ancient custom, before the medical staff appear on the ward. The peak period of work in the morning thus occasions an unnaturally early start to the patient's day. This, the team found, begins on an average at 5 A.M. and ends at 10 P.M., and there is little chance for him to sleep undisturbed in between. The amount of work expected of the night nurse, in preparation for the morning peak, is beyond her capacity if the patient is to be wakened at a reasonable hour. The physical needs of patients, the report points out, cannot be altered; so any attempt to eliminate peak periods of work for nurses must depend on the coöperation of the medical staff and other specialist services. The team do not offer any evidence that this has been forthcoming so far, though they politely abstain from criticism.

Their suggestions for a better way of doing things turn on the proposal that nursing should be done by trained nurses, and not merely supervised by them. Basic nursing, they say—and we warmly agree with them—should not be delegated to an auxiliary grade; nor should nursing be thought of predominantly as a matter of exercising special technical skills. Each trained nurse, they suggest, should be responsible for a specified group of patients, "a nursing unit," and should have the help of nursing auxiliaries who may be either student nurses, assistant nurses, pupil assistant nurses, or orderlies. Trained nursing skill would thus be conserved for its "proper" task, the whole nursing care of the patient. This could be done, they believe, by reallocating many non-bedside tasks, by providing adequate nursing equipment and labour-saving devices, by revising working hours of staff to provide enough hands at peak periods and by having more reliefs. It will be possible only if the status of trained staff in hospitals is made attractive enough to persuade nurses to remain at work there. The ward-sister should, as now, be chief administrator, with complete responsibility for the care of her patients; but she should have as her right-hand woman a personal secretary, like other busy and responsible people. She would thus have time to teach her students, and they would have time to pause and learn. This is one of the experiments which has long deserved a trial, and there are others—such as a shortened course for students—with which it might well be combined. Such experiments have been advocated, on general principles, for a long time. But this report gives the backing of fact which those advocating such experiments have long needed. It does not bring to light much that critics of nursing training have not known or guessed; but their generalisations can no longer be set aside as mere opinion. Here are facts.

Acute Respiratory Insufficiency

OF the many patients now suffering from a seasonal exacerbation of respiratory disease a fair number present a clinical picture familiar yet little discussed and without an agreed name. Around London this winter their number was much increased by the severe fogs. Such a patient is commonly a man in late middle age who has had a cough for some years and has become moderately short-winded. Quite suddenly his condition becomes very much worse, with urgent dyspnœa and severe general upset. His face has a purplish flush; his eyes are bloodshot; his lips and tongue are cyanosed; his hands are warm; and his pulse is rapid and full. The jugular venous pressure may be raised, and if the condition has persisted for

some days œdema may be found. Examination of the chest most commonly reveals restricted movements and suppressed breath-sounds with scattered crepitations and occasionally conspicuous rhonchi. The sputum is purulent, and may have only recently become so. The temperature may be normal or moderately raised. Because of the added sounds in the chest and the manifest severity of the illness bronchopneumonia is often diagnosed; but radiographs seldom show consolidation. The arterial blood sample will have diminished oxygen saturation and raised carbon dioxide content and tension.

The diagnosis of cor pulmonale applies to those patients who have raised jugular pressure or œdema; this is a complication, common but not inevitable, of the disorder common to all—acute respiratory insufficiency. Usually in these patients moderate emphysema or other widespread disorder of pulmonary function has been suddenly aggravated by bronchial infection. How the infection, without necessarily extending into the alveoli, causes this abrupt functional deterioration is unknown. Bronchiolar congestion or constriction increases the work of breathing in some but not all of the patients; the fever is seldom great enough to provoke a large increase in oxygen needs; and one is led to suspect that the infection has in some way disturbed the distribution of pulmonary blood-flow.

The patient appears desperately ill; but, unless he was previously in heart-failure, he will probably recover. Because the spontaneous improvement may be as dramatic as was the onset, it is easy to overvalue any treatment. Morphine, sometimes given under the impression that the patient has left ventricular failure, may prove rapidly lethal. Intravenous digitalis and venesection (tempting because of the bulging veins) are also best avoided. Chemotherapy, however, is indicated, and fortunately penicillin is still usually effective. Isopropyl adrenaline, inhaled in a spray, will often relieve bronchiolar obstruction, and should be tried if the nature of the respiratory efforts suggests increased airway resistance. Arterial anoxæmia—the most serious consequence of the impaired respiratory function—can be corrected by increasing the oxygen content of the inspired air. This is most conveniently done by means of a tent; and by maintaining a good flow it is nearly always possible to restore the arterial saturation to a safe level. At best, however, this leaves unaltered the hypercapnia and respiratory acidosis, which unfortunately may sometimes be aggravated. This is because the more severely affected patients have modified their chemical respiratory drive and have come to rely on anoxia as the main respiratory stimulus. When the anoxia is relieved by breathing oxygen the ventilation falls and carbon dioxide retention is increased; and this can lead to headache, drowsiness, and even coma.[1] The reasonable way to counter this development is to maintain or increase ventilation. BOUTOURLINE-YOUNG and WHITTENBERGER [2] first reported favourably on the use of a respirator; and STONE et al.[3] have described four cases treated by this means: three were treated successfully with a Drinker respirator, and the fourth with an intermittent-pressure device. STONE et al. evidently feel that the respirator was an important factor in the patients' recovery, but most of those who have tried this treatment are likely to remain unconvinced. The Drinker respirator, designed for a paralysed patient, is far from ideal: the patient feels congested and dislikes lying flat; he probably has difficulty with sputum and is much alarmed if head movements are restricted. Because of his mechanical disabilities high pressures must be used to maintain a reasonable tidal air, and these cause uncomfortable movement of the neck seal. Moreover with a restricted tidal air high respiratory rates are needed, and these the standard motor cannot supply. Nor does any commonly available respirator seem much better. Possibly "electrophrenic respiration" [4] or a really effective respiratory-stimulant drug may prove preferable. At present the mechanical augmentation of ventilation in this type of respiratory insufficiency, in contrast to that due to muscular weakness, remains a therapeutic tour-de-force which can be effected if the patient can stand it.

In all this it is important to keep a sense of proportion. Most patients with acute respiratory insufficiency manifestly benefit from oxygen therapy despite some rise in carbon dioxide tension. Only a few patients become comatose or develop other serious troubles, and with these it is always possible to moderate the oxygen therapy to attain the best compromise. All who treat such patients should be aware of the possibility of respiratory depression, but patients must not be allowed to die of anoxia because of an exaggerated fear of carbon dioxide poisoning.

B.C.G.

IN 1922 WEILL-HALLÉ tried to protect children against tuberculosis by giving them the attenuated strain of tubercle bacilli produced by CALMETTE and GUÉRIN. During the next 25 years the vaccine was used extensively in many countries. Much work was done on its preparation and properties, its ability to induce tuberculin skin-sensitivity, and its alleged production of immunity to tuberculosis. But by 1947, when vast campaigns of vaccination were started by the International Tuberculosis Campaign, little precise information about B.C.G. was available, and it soon became clear that scientifically controlled studies were urgently needed. The Tuberculosis Research Office of W.H.O., with the collaboration of the Danish State Serum Institute and the International Tuberculosis Campaign, began a series of investigations into some of the basic problems; and the research office has now produced a monograph [5] which contains not only the reports of the separate investigations, many of which have already been published, but the complete quantitative data on which they are based. It is a valuable record of carefully planned and executed international research. There is no method of detecting or measuring immunity to tuberculosis produced in an individual by B.C.G. vaccination. The local reaction and the induced skin-sensitivity to tuberculin have generally been regarded as guides to the effectiveness of the vaccination, although CALMETTE himself considered

1. Davies, C. E., MacKinnon, J. *Lancet*, 1949, ii, 883.
2. Boutourline-Young, H. J., Whittenberger, J. L. *J. clin. Invest.* 1950, **30**, 838.
3. Stone, D. J., Schwartz, A., Newman, W., Feltman, J. A., Lovelock, J. *Amer. J. Med.* 1953, **14**, 14.
4. Whittenberger, J. L., Sarnoff, S. J., Hardenbergh, E. *J. clin. Invest.* 1949, **28**, 124.
5. Edwards, L. B., Palmer, C. E., Magnus, K. B.C.G. Vaccination. W.H.O. monograph series. Geneva, 1953.

sensitivity unimportant. The W.H.O. investigators have wisely begun by concentrating on a close study of these skin reactions, and they have used them to determine, among other things, the effect on the vaccine of storage, heat and light, and variations in preparation and concentration, as well as the results of mixing living and dead bacilli and varying the technique of intracutaneous vaccination. The results were summarised by PALMER [6] and discussed in these columns.[7]

Perhaps one of the most important contributions of the W.H.O. team is their insistence that tuberculin sensitivity is quantitative and not a simple qualitative phenomenon that may be described as present or absent, positive or negative. They produce convincing evidence that the sensitivity of groups of people cannot be adequately described by such inexact and often almost meaningless estimates as the "percentage of positive reactors." The skin reactions must be measured and the level of tuberculin sensitivity expressed in terms of the distribution and mean size of the reactions in the group as a whole. In this way it is possible to discriminate differences between groups that might be missed by less precise methods. The accurate measurement of the diameter of the indurated area requires skill and practice. Even with experienced workers the experimental error is not insignificant,[8] and with those less experienced it may be very large. But if the tuberculin skin reaction continues to be looked upon (and described to students) as a rough qualitative test, no-one will trouble to acquire skill in its use. Many investigations have shown how valuable the quantitative use of the reaction can be. For example, BENTZON [9] demonstrated changes in tuberculin sensitivity during some of the infectious diseases, and MEYER [10] studied the standardisation of tuberculin preparations in man. Careful measurement of the reactions during the preliminary skin-testing in the W.H.O. investigation revealed some interesting differences in the patterns of tuberculin sensitivity in the countries concerned.[11] These differences could not have been found if the all-or-none method of recording results had been used. The frequency-distribution of the reactions to small doses of P.P.D. tuberculin showed that there seemed to be three main kinds of tuberculin sensitivity—high-grade and low-grade sensitivity and relative insensitivity. The high-grade sensitivity is thought to be due to infection with *Mycobacterium tuberculosis*; but certain characteristics of the low-grade sensitivity, coupled with earlier and similar observations in the U.S.A.,[12] suggest that this sensitivity is independent of true tuberculous infection. Low-grade sensitivity, it seems, has much to do with geographical factors; for example, it was much commoner in India and Egypt than in Denmark and Mexico City; and in the mountainous area around Darjeeling low-grade sensitivity was commoner in the low-lying valleys than in the higher tea plantations.[13] This sensitivity, it is suggested, may be due to infection with an organism antigenically related to *Myco. tuberculosis*. Perhaps this explanation is an over-simplification, but the hypothesis, if true, has many important implications. For instance, the results of tuberculin surveys expressed in "percentage positive" figures may not be valid measures of the frequency of tuberculosis in a population. It may well be that surveys in some countries have overestimated the prevalence of the disease. The W.H.O. monograph is concerned only with tuberculin sensitivity, and the authors have avoided accepting the assumption that a large local reaction and a high level of skin-sensitivity indicate immunity and a "successful" vaccination. Their work shows that the local reaction and the sensitivity are much influenced, sometimes independently,[14] by many factors in the preparation and administration of the vaccine. If local reaction, sensitivity, and immunity run parallel with one another, the immunity produced by the many million vaccinations so far performed must be extremely diverse in both degree and value. But there is little evidence at present to justify the belief that the vaccination lesion or the postvaccination sensitivity are necessarily reliable measures of the production of immunity.

The past year has brought two new reports of extensive investigations into the results of B.C.G. vaccination. DAHLSTRÖM and DIFS [15] studied the tuberculosis morbidity in over 60,000 conscripts to the Swedish army: they found that the incidence of primary tuberculosis in those not vaccinated was approximately five times as high as in those vaccinated; and the incidence of postprimary tuberculosis was about three times as high. ARONSON and ARONSON [16] have continued their work among groups of Indians in the U.S.A. and Alaska. Their assessment of B.C.G. is based on carefully compiled mortality figures. During 15 years' observation the mortality from tuberculosis was six times as high in the non-vaccinated as in the vaccinated. Although the method of allocating the children to the groups was unfortunately not up to the highest statistical standards, this report, added to the latest news from Sweden, makes out a strong case in favour of the protective powers of B.C.G.

B.C.G. vaccination is now being carried out on a huge scale throughout the world. In this country its use is still limited to certain groups of people thought to be exposed to the greatest risk of infection. These favourable reports have prompted further discussion about whether it should be used more widely and to what sections of the population it should next be offered. The discussions are always concerned with groups and categories, such as infants, "school leavers," and National Servicemen; little is heard on the question of whether B.C.G. should be made available to individuals. At present, a child who is not a "contact" cannot be vaccinated, however much the parents and the general practitioner desire it without reference to a chest physician. B.C.G. vaccination in this country has rightly been judged as a matter for planning and strict control; but there now seem good reasons for lessening control, while preserving the general plan of campaign.

6. Palmer, C. E. *Lancet*, 1952, i, 935.
7. *Ibid*, p. 953.
8. Meyer, S. N., Hougen, A., Edwards, P. *Publ. Hlth Rep., Wash.* 1951, **66**, 561.
9. Bentzon, J. W. *Tubercle*, 1953, **34**, 34.
10. Meyer, S. N. *Amer. Rev. Tuberc.* 1952, **66**, 292.
11. Edwards, L. B., Palmer, C. E. *Lancet*, Jan. 10, 1953, p. 53.
12. Palmer, C. E., Ferebee, S. H., Stange Petersen, O. *Publ. Hlth Rep., Wash.* 1950, **65**, 1111.
13. Bates, L. E., Busk, T., Palmer, C. E. *Ibid*, 1951, **66**, 1427.
14. Palmer, C. E., Edwards, P. Q. *Brit. med. J.* Feb. 14, 1953, p. 363.
15. Dahlström, G., Difs, H. *Acta tuberc. scand.* 1951, **25**, suppl. 27.
16. Aronson, J., Aronson, C. F. *J. Amer. med. Ass.* 1952, **149**, 334.

Annotations

INFLUENZA 1953

DISASTROUS floods and fogs have made this one of the worst winters for a long time; and influenza, making its biennial attack in this country, has added to our difficulties. But, in general, influenza has so far been mild. On its previous visit, two years ago, the influenza-A virus swept rapidly through the country, and in the first month of that epidemic there were nearly 5000 deaths from influenza. In the present epidemic the deaths from influenza have climbed slowly, and during the same period there were rather less than 600. Once more, deaths have been most numerous in elderly people—about 90% of those who have died were over the age of 55. A curious feature of this year's epidemic is that the incidence of influenza has been very much greater in the south of England than in other parts of the country; but perhaps that is simply a reflection of the higher incidence in the north during the 1950–51 epidemic. Some idea of the size of the epidemic comes from the claims for sickness benefit received by the Ministry of National Insurance; about 100,000 claims in excess of normal were recorded for the week ending Feb. 3, and most of these claims were probably the result of influenza.

At about the same time as the epidemic appeared in this country, sharp outbreaks were reported from France, Germany, and the U.S.A. Slightly earlier there was a severe epidemic in Japan, and lesser outbreaks have since been reported from Scandinavia, Finland, Holland, and Switzerland. Detailed laboratory and epidemiological observations must be completed before the source or sources of this year's influenza can be identified or the method of spread traced. Preliminary laboratory reports indicate, however, that in all the countries involved A-prime viruses have been recovered. Those isolated in this country show an antigenic similarity to strains recovered this year in the U.S.A., Japan, and Denmark, and also to the Scandinavian subtype which was partly responsible for the European epidemic of 1950–51. On the other hand, strains from France and Switzerland seem to resemble the Liverpool subtype which was also prevalent in 1950–51. It seems, therefore, that this year's epidemic had at least two foci of origin.

When the spring has chased these troubles away, the lessons of this year's epidemic will be clearer. In particular, the results of the influenza vaccine trial, organised by the Ministry of Health and the Medical Research Council, and of the epidemiological investigations of the World Health Organisation influenza programme, will be awaited with great interest in the hope that we shall be able to look forward to our next encounter with the virus with greater confidence.

DETERGENTS

THE domestic use of detergents has increased enormously, and some of the results are causing concern. Mostly these agents are products of the petroleum industry; they are paraffin-chain salts, their long hydrocarbon chain having an electrolytically dissociated group at or near the end. They thus have strong surface activity which favours the penetration of water into the interstices of fabrics. They also exercise a powerful emulsifying action on greasy dirt; the film on the threads of cloth is rolled into loosely adherent globules which are easily detached by agitation and can be rinsed away.[1] In the home detergents are used, as well as for laundering clothes, to wash dishes and utensils; and in industry they are used for various degreasing processes. They also find a proper use in dermatology as emulsion bases and in antiseptic shampoos and the like. The domestic detergents foam readily and are apt to be judged by this quality. Foam, however, though it breaks up the oil and mechanically assists removal of dirt, is not necessary for detergent action, which may be little reduced by the addition of antifoaming agents.[2]

Detergents prove harsh to some skins, and may even cause dermatitis; they may act as primary irritants or may produce sensitisation. Their action may be partly due to their defatting and drying effect, which may aid the penetration of other irritants or aggravate constitutional skin disease. As Hodgson[3] points out, however, these agents are a valuable aid to the housewife, who soon learns which brand, if any, she must avoid. The commercial firms are aware of the danger, and before marketing their products usually submit them to immersion and patch tests on the human skin.

When the detergent leaves the kitchen sink, other problems arise. At the sewage works it is usual, especially on Tuesdays, to find that the agitation in the aeration tanks has produced a surface layer of foam as much as six feet deep. The narrow service "roads" between the tanks are slippery and dangerous; and huge masses of foam are liable to be whipped off by the wind, perhaps carrying pathogens and certainly a potential danger to car-drivers, on whose windscreens they may alight. In America such masses of foam are believed to have accounted for some "flying saucers." How far detergents interfere with the biological processes of sewage purification is not fully known; but they are not removed by present methods of treatment and therefore reach the effluents and the rivers into which these may discharge. River and harbour boards are concerned about the possible effect of these agents on fish or on the food of fish. Further, if the river should be a source of water-supply, the water undertaking is perturbed about the possible effects of the continued presence of detergents on the purification plant and on consumers.

There is no simple answer to this problem. The use at sewage works of water-sprayers or of chemicals with an anti-foaming action has been suggested. These, however, would increase the cost of sewage treatment and might bring other difficulties in their train. Workers in the U.S.A., who have longer experience of the trouble, have so far not found a solution. Clearly there is urgent need for research, in which we hope that the authorities and scientists interested will have the full coöperation of the manufacturers.

ONE REGISTER FOR PHARMACISTS

UNLIKE medicine or dentistry, pharmacy has two statutory registers, and consequently the term "registered pharmacist" includes the two groups, "pharmaceutical chemists" and "chemists and druggists." The reasons for this apparent anomaly lie in the history of the profession. The first Pharmacy Act, passed in 1852, sought to prevent ignorant and incompetent persons from assuming the title of, or pretending to be, pharmaceutical chemists or pharmaceutists or members of the Pharmaceutical Society. Accordingly the Act directed that a register of pharmacists and their assistants and apprentices should be established and maintained. Seventeen years later further legislation permitted assistants to become "chemists and druggists," entitled to sell and supply poisons, so that for over eighty years there have been two registers of people with these privileges.

Pharmaceutical chemists form less than one-tenth of the membership of the Pharmaceutical Society (membership of the society has been coextensive with registration as a pharmacist since the Pharmacy and Poisons Act, 1933, became law). They have had no advantages, apart from that of title and the benefits of having reached a higher educational standard. Formerly, the majority

1. Adam, N. K., Stevenson, D. G. *Endeavour*, January, 1953, p. 25.
2. Sisley, J. P. B. *Corps gras industr.* 1943, **1**, 66.
3. Hodgson, G. *Practitioner*, 1953, **170**, 166.

of pharmaceutical chemists first passed the minor examination; but since the introduction of university degrees in pharmacy, graduates have obtained this higher title by way of a greatly modified examination. In practice, however, no-one outside the profession realised that any distinction or difference existed. Recently the Pharmaceutical Society ceased to examine at the "chemist and druggist" level; so the holders of this title now form a dwindling group. The Pharmacy Bill, a private member's Bill now before Parliament, seeks to place all pharmacists on the register of pharmaceutical chemists. If this becomes law, the present chemists and druggists will receive the title of "pharmaceutical chemist" by way of bonus. Perhaps the existing holders of this qualification will feel they have suffered some loss of status and they may wish for a distinctive title as a sign of the standard they have attained.

The century-old Act not only prohibited the Pharmaceutical Society from conducting examinations in medicine, surgery, and midwifery, but also debarred members of the medical profession from registering as pharmaceutical chemists; the new Bill will repeal the latter and retain the former provision. Certain domestic matters of the society, including the abolition of the limit on the annual retention fee paid by members, are also covered by the Bill. The Bill is sponsored by members on both sides of the House and seems to contain little that is controversial. Incidentally, there is talk at the moment of establishing an examination in practical pharmacy for unqualified assistants; but it is to be hoped that this will not lead to a repetition of history and a demand for legislation to recognise a new class by statute.

MEDICINE AND GEOGRAPHY

ORGANISED scientific collaboration between the different countries of the British Commonwealth is one happy result of the late world war. Representatives of the Medical Research Council, Department of Scientific and Industrial Research, Agricultural Research Council, and Commonwealth Agricultural Bureaux have met regularly in London since 1946 with scientific representatives of Canada, Australia, Southern Rhodesia, South Africa, India, New Zealand, the Colonies, and latterly also Pakistan and Ceylon, to see what can be done to improve the exchange of scientific information and of specialist scientists, and how national laboratories can work for the benefit of the whole Commonwealth or share in international research. The fruits of this combined approach include an index of English translations of foreign scientific papers, a book listing inter-Commonwealth postgraduate scholarships in science, maps of the prevalence of insect and fungus plant diseases, and the coördination of culture collections of micro-organisms; two reference laboratories of the Public Health Laboratory Service at Colindale (dysentery and food-poisoning) now work for the whole Commonwealth, with the exception of Canada. These and other achievements are recorded in the report, just published,[1] of a special Commonwealth conference held in Australia last year.

On the whole this scientific liaison work is for the benefit of official science, and relatively little is of medical import; but geographical anthropometry—the study of the normal physical standards of inhabitants of different countries or of different tribes in a single country—is proposed as suitable for research by collaboration throughout the Commonwealth. This not only is essential for defining where disease begins, but may also prove a good test of the value of somatotyping and similar attempts to classify human physiques. It seems a pity that the conference turned down a proposal to study geographically the prevalence of dental caries—apparently because this would be better investigated on a full international scale. The Commonwealth is large enough for useful studies on the geography of many diseases; and to wait till, say, the World Health Organisation has money for international research of this sort and can persuade its member nations to collaborate may be to wait a very long time. The American Geographical Society has already begun to publish maps of the distribution of diseases [2] and how this is changing with the years; and Sigerist [3] has discussed the kind of useful work to be done. Research on this subject can only be by international collaboration; and the British Commonwealth Scientific Conference ought to consider further how it might be promoted—for instance, by coördinating the work of national health departments on the notification of disease.

1. British Commonwealth Scientific Conference, Australia, 1952: Report of Proceedings. H.M. Stationery Office. Pp. 74. 3s.

RUPTURE OF THE BLADDER

THE early diagnosis of intraperitoneal rupture of the bladder may be difficult. Moreover, Negley [4] emphasised its importance by drawing attention to the danger of spread of infection; he found that the operative mortality within the first twelve hours was 11%; it rose to 22% after twelve hours, and to 43% by the second day. Various tests for the earlier diagnosis of this condition have been suggested and tried. Recently, Cipolla and his colleagues [5] reported that in dogs a 0·5% solution of fluorescein was not absorbed from an intact bladder, but was readily absorbed from the peritoneal cavity and could be detected later in the blood-stream. Similar results were obtained in experiments on human beings. The authors suggest that in every case of suspected rupture of the bladder a 10 ml. specimen of blood should be taken, and then 100 ml. of a 0·5% solution of fluorescein passed through a urethral catheter into the bladder. The control serum is compared with three specimens of serum removed at intervals of five minutes; the presence of fluorescein confirms the diagnosis. A tear in the bladder may be plugged by omentum and the perforation may not be detected by other tests. In dogs, Cipolla et al. found that less fluorescein was absorbed when the tear was plugged by omentum than when it was open to the peritoneal cavity; and they suggest that this finding may be used to distinguish between a ruptured bladder which is sealed with omentum and one which is not.

DIAGNOSIS OF MYASTHENIA GRAVIS

BEFORE the introduction of neostigmine by Mary Walker in 1935 myasthenia gravis was usually diagnosed by observing the characteristic distribution of the muscles affected—the occular and bulbar muscles and proximal rather than distal limb muscles—and by the history of diurnal fluctuations as well as remissions and relapses over months or years. The greatest difficulty arose in patients with an unusual mode of onset, those with no tendency to remission, and those who in an early stage of the disease showed no physical signs and might be diagnosed as hysterical.

Neostigmine, with its rapid action, was widely welcomed as a diagnostic agent. The patient whose muscular power is not increased by a dose of 1·5 mg. intramuscularly or 0·5 mg. intravenously has not got myasthenia gravis—though the response varies widely from one patient to another. Neostigmine may, however, also cause some temporary improvement in thyrotoxic myopathy [6 7] and in dysphagia due to early progressive bulbar palsy. Moreover, it has to be used with some care, and always with atropine (0·6 mg.) because of its

2. *Sci. Amer.* February, 1953, p. 22.
3. Sigerist, H. E. A History of Medicine. New York and London, 1951; vol. 1, p. 66.
4. Negley, J. C. *J. Urol.* 1927, **18**, 207.
5. Cipolla, A. F., Khedroo, L. G., Casella, P. A. *Surgery*, 1953, **33**, 102.
6. Laurent, L. P. E. *Lancet*, 1944, i, 87.
7. Sheldon, J. H., Walker, R. M. *Ibid*, 1946, i, 342.

tendency to cause intestinal colic and, more rarely, vomiting.

Osserman and Kaplan [8] have described their experience with a new antimyasthenic substance as a diagnostic agent. This substance, edrophonium chloride (3-hydroxyphenyldimethylethyl-ammonium chloride) was given intravenously in a 10 mg. dose without atropine. Results comparable to those from 0·5 mg. of neostigmine were seen, with no unpleasant side-effects, in 15 myasthenics. The new drug has a brief action of less than an hour, and will therefore have no place in treatment. In the consulting-room and the outpatient department, however, it should prove useful because of the absence of side-effects and the fact that if a first injection gives a doubtful result a second, larger dose may be injected an hour later. Doses of up to 20 mg. are well tolerated.

HEPATIC BLOOD-FLOW

THERE is as yet no satisfactory simple method of determining the hepatic blood-flow in man. A reliable indirect method would be invaluable to the clinical scientist; direct measurements such as those made in animals are of course out of the question.

The methods now in use are based on the Fick principle, by which the volume of blood passing through an organ can be calculated from the difference in concentration of some arbitrarily chosen substance in the afferent and efferent blood. To make this calculation in the case of the liver, samples of blood must be obtained from the hepatic veins—by no means a simple matter. Several observers,[9 10] however, have used this method with bromsulphalein as the test substance; and the average hepatic-flow in subjects without hepatic disease was 1 ml. of blood per ml. of liver substance per minute. A further serious drawback to this method has been revealed by having the catheter in different positions in the hepatic vein; this has shown that different areas of the liver differ in their ability to extract the dye. Thus it is almost impossible to obtain a true mixed hepatic-vein sample.

Dobson and Jones [11] have shown that the phagocytic activity of the liver for radioactive particulate matter injected intravenously gives a guide to the hepatic blood-flow; and thus the need for catheterisation of the hepatic vein is obviated. They showed in dogs, rabbits, mice, and rats that over 90% of an appropriate suspension of radioactive chromium phosphate was retained within the liver and spleen. Moreover the liver extracted more than 90%—i.e., hepatic venous blood contained less than 10% of the radioactive material that was present in portal blood. (Since almost all the blood passing through the spleen also flows through the liver, the phagocytic activity of the spleen does not significantly affect the calculation of hepatic blood-flow based on the rate of removal of the radioactive suspension.) It is therefore apparent that, at least in these animals, hepatic blood-flow could be calculated fairly accurately from the rate of removal of the intravenously injected test substance. After the material has been injected intravenously samples are withdrawn at short intervals to estimate the quantity still remaining in the blood-stream. From the time taken for this to fall to 50% of the initial value, the minimal hepatic blood-flow can be readily calculated. This figure is a minimal value because the calculation is based on the supposition that the liver removes 100% of the foreign particulate material brought to it. The correct figure is probably only 90%, and the true hepatic blood-flow is thus 10/9 times that calculated.

Owing to the undesirability of injecting radioactive material, Dobson and Jones have restricted their clinical study to cases in which such injections were given for therapeutic purposes. Three cases of malignant disease with grossly enlarged livers were investigated. Owing to the obviously pathological state of the liver, the values obtained for hepatic blood-flow were probably grossly abnormal; these values ranged from 0·7 to 1·7 volumes of blood per volume of liver per minute. The principle of the test does not, however, depend on radioactivity per se; and there is no reason why non-radioactive inert particulate material should not replace the chromium phosphate used in these experiments. All that is required is some substance that can be easily and accurately estimated in micro quantities. Alternatively a radioactive particulate substance could be used which has a much shorter half-life than 14 days—the half-life of the P^{32} used in the radioactive chromium phosphate. With such material the hepatic blood-flow and the factors influencing it could be safely studied in man.

WEATHER AND POLIOMYELITIS

POLIOMYELITIS keeps cropping up in the winter, but the great majority of cases arise in the summer and autumn. One unexplained exception to this rule, however, has been reported from Melbourne, where the three main poliomyelitis epidemics since 1937–38 have reached their peak between July and October—the coldest and wettest season of the year.[1] In New York State the ratio of summer to winter cases in a series of epidemics was 12 : 1, compared with 2·2 : 1 in Japan during the same period.[2] This suggests that degree of climatic difference between summer and winter may be an important factor in determining the seasonal distribution of cases; but it would be unwise to assume that the endemic poliomyelitis of Japan can be simply compared with the epidemic disease of the U.S.A.

In the United Kingdom the first great epidemic of poliomyelitis was in the summer of 1947, which was hotter than the average; and at the time it was widely believed that this might be a causal factor. Bradley and Richmond [3] have now studied the relation between temperature and humidity readings and the incidence of poliomyelitis in England and Wales during the six years 1947–52. The average weekly dry-bulb and vapour-pressure readings in London, Plymouth, Manchester, and Tynemouth were tabulated against the estimated number of people infected each week. These figures for infection were calculated by dating back the uncorrected weekly notifications by three weeks, in order to bring them as far as possible into line with the meteorological conditions at the time when the patients were likely to have been infected. The results are inconclusive; but they do confirm that poliomyelitis in these six years was definitely seasonal, the season each year extending from the 18th to the 42nd week. The rise in each year did not take place until a certain level of temperature and humidity had been reached; but these alone did not necessarily initiate the rise. The seasonal fall was even more independent of such meteorological factors. Moreover the incidence of poliomyelitis during the season was not clearly related to variations in temperature and humidity. The seasons with the lower average dry-bulb and vapour-pressure readings tended to have the lowest incidences of poliomyelitis; but this could have occurred by chance. It seems clear that other factors besides high temperature and humidity determine whether there shall be an epidemic of poliomyelitis.

DR. HAROLD BALME, consultant adviser on rehabilitation to the Ministry of Health and to the World Health Organisation and a former president of Cheeloo University in China, died on Feb. 13 at the age of 74.

8. Osserman, K. E., Kaplan, L. I. *J. Amer. med. Ass.* 1952, **150**, 265.
9. Bradley, S. E., Ingelfinger, F. J., Bradley, G. P., Curry, J. J. *J. clin. Invest.* 1945, **24**, 890.
10. Lavers, G. D., Cole, W. H., Keeton, R. W., Gephardt, M. C., Dyniewicz, J. M. *J. Lab. clin. Med.* 1949, **34**, 965.
11. Dobson, E. L., Jones, H. B. *Acta med. scand.* 1952, suppl. 273.

1. Annual Report of Fairfield Hospital, Melbourne, 1952.
2. Paul, J. R. *Amer. J. Hyg.* 1947, **45**, 206.
3. Bradley, W. H., Richmond, A. E. *Mon. Bull. Minist. Hlth Lab. Serv.* 1953, **12**, 2.

Special Articles

REABLEMENT OF HOUSEWIVES

A Lead from King's College Hospital

WHEN the housewife lays down her tools the effect on her family is much like that of a general strike on the nation at large. Ordinary pursuits are delayed and hampered, and special projects interrupted by the basic requirements of civilised living—meal-getting, house-cleaning, and washing-up. Reablement of men for industry, and of children for the schoolroom, has gone far; but the housewife disabled by rheumatoid arthritis, poliomyelitis, hemiplegia, or other disaster gets, if she is lucky, some physiotherapy and a few cheery words of encouragement. These are good in their way, but seldom fit her to get herself up, washed and dressed in the morning, or to do the vegetables, brush a floor, clean a saucepan, open a tin, or generally keep the home fires burning—even in a literal sense.

It is easy to plan a reablement programme from the wrong end, beginning with what the patient hopes to do in his job rather than with what he can immediately do for himself. Dr. F. S. Cooksey, who is in charge of the physical-medicine department at King's College Hospital, points out [1] that though the personal activities of daily living are considered seriously in special centres for the limbless, the paraplegic, and the blind, they are ignored as far as the general run of disabled patients are concerned. His department offers a programme of reablement specially designed for housewives, beginning with the movements needed in dressing, feeding, getting in and out of a bath, using a toilet, and so on, and proceeding to all the skills required in getting a dinner.

USES OF OCCUPATIONAL THERAPY

The centre is small for the work it does. Rooms of various sizes have been partitioned off from a central space containing a desk for a secretary. One small room has been set aside for patients who need to practise dressing and undressing; and the walls are hung with a number of encouraging gadgets showing that this task can be greatly simplified. Men as well as women need this kind of help; so the gadgets include cuff-links which, having been put into the shirt in advance, expand on a spring and let the hand slide through the cuff; elastic shoe-laces which can be left permanently in the shoes; a long-handled shoe-horn which makes it easy to put the shoes on without stooping; and a device for sliding into nylon stockings, again without stooping, and also—which the wearer doubtless thinks even more important—without getting them snagged by the toe-nails. A tie, already neatly tied, is mounted on a spring like a bicycle clip, which can be snapped round the neck with one hand; and members of either sex, using a towel attached to the wall by a spring, can practise the motions needed for drying the back after a bath. Other encouraging exhibits are knives and forks with big handles, easily grasped by a partly paralysed hand, and spoons bent round at an angle so that they can be raised to the mouth by those whose elbows are fixed.

In a neighbouring workshop patients of both sexes are engaged in occupational therapy—but with a difference. They are making objects of use in the hospital (like rubber-covered rockers to be worn with plasters), and the tasks are assigned not on grounds of interest or variety but simply because they benefit a particular joint or group of muscles. Many patients, it seems, prefer sticking at a repetitive job which is benefiting a disabled limb to completing an object in which they have no particular interest. This preference became apparent when patients who attended rigorously at the gymnasium for directed physical training, and also put in strenuous hours doing unsupervised exercises in the department, failed to turn up for occupational therapy. When set to do a repetitive job which exercises the damaged limbs, they will attend regularly, without complaining of monotony.

THE KITCHEN UNIT

Some women are to be found in the general workshop; but they are few, for the chief workshop of a housewife is her kitchen, and the movements she needs to master are those she uses in getting the dinner. Dr. Cooksey has therefore set up a kitchen in another room in the centre; but—again—a kitchen with a difference.

The working bench, with the sink in the middle, is flanked at one end by the oven and hot-plate of the gas cooker (which are separate and side by side) and at the other by a refrigerator (fig. 1). The hot-plate, and the middle shelves of the oven and refrigerator, are all on the same level as the top of the bench, and this is set at a convenient working height for a patient sitting in a wheel-chair. The top of a stout trolley is also at the same height, and dishes can thus be slid from the bench to the trolley, and from the trolley to the oven, with no lifting. The trolley-top is boxed in with stout wooden planks, partly to prevent things from slipping off it and partly so that

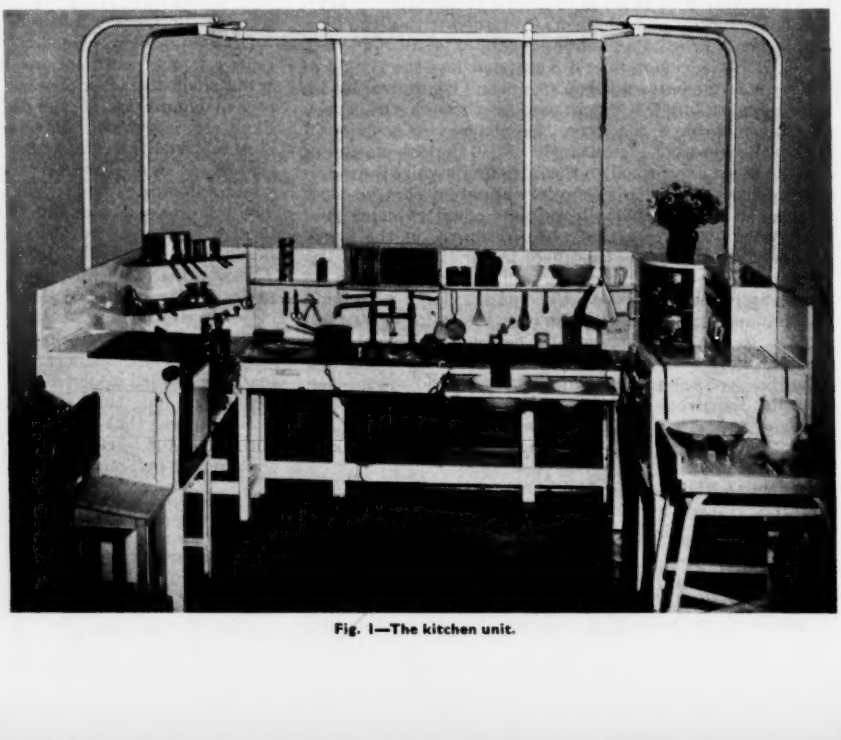


Fig. 1—The kitchen unit.

1. *Ann. phys. Med.* 1952, **1**, 120.

patients who need support can grasp the sides firmly and use the trolley as a walking-chair (fig. 2). Patients working at the sink need never lift a kettle to fill it, for the taps are fitted with a swinging delivery pipe, of the type used in operating-theatre basins, which will fill a kettle as it stands on the draining-board. Moreover, the taps turn on and off by levers.

A flap which pulls out from the front of the bench is pierced with three circular holes, one of a diameter to take a pastry bowl, one to take a pudding basin, and one fitted with a gripping lining which holds jars firmly so that their lids can be removed with one hand. A square socket fixes tins of a standard size, for the same purpose. A clamp fixed to the bench behind the pastry bowl can be used to hold a variety of tools—a potato-peeler, an egg-whisk, a mincer, a grater, and others. The hemiplegic housewife is thus able to do with one hand many jobs which normally take two. Along an overhead track, running from end to end of the bench, a sling attached to a spring can be made to travel (fig. 1). A weak arm (damaged perhaps by poliomyelitis) which cannot work against gravity will often do much more when supported

Fig. 2—The food trolley used also as a walking-chair.

in such a sling (fig. 3). A bow-fronted cupboard at one corner of the bench is fitted with circular shelves which rotate round a pivot, so that there is never any need to reach to the back of a shelf, or take out half the contents in search of one elusive tin.

The oven lights from a pilot jet when a tap is turned. Hot dishes are transferred to the trolley and wheeled to the table, where—since the table is usually the lower—a flap can be let down from the trolley to form a slope down which the hot dish is gently slid. Arthritic patients who find it difficult to sit, or to rise from ordinary chairs, are provided with stools with seats at the height to suit them, and with the seats sloping downward and forward. Such a stool, made to suit the individual in the hospital workshops, allows the patient to take the weight off her painful joints when working. Those who are not too steady on their legs find their confidence greater when using a safety-belt, clipped to the front of the bench by leash-snaps. In this very kitchen patients take it in turns to prepare the daily dinner eaten by the dozen or more

Fig. 3—Working with the sling which runs along an overhead track.

patients, men and women, attending the reablement department throughout the day.

EQUIPPING THE HOME

Most of the equipment used is so simple that it can easily be copied in the patient's own home; and when the housewife leaves hospital the occupational therapist from the department goes to her home and discusses with her and her husband what she will need in her work—usually a board between cooker and sink, to save lifting, a board to steady bowls, a universal clamp for tools, and perhaps a trolley and stool. Most of these things are made by patients in the workshop and supplied at the cost of the materials used. A curtain-runner makes a good overhead track for a sling, and handrails are easily fitted in lavatories and bathrooms. If the family cannot meet the cost, the almoner helps to find ways of paying it. Recently [2] Lambeth Borough Council decided to make the necessary alterations for patients who live in their flats—a generous and sensible decision, for the time of everybody in the family is saved if the housewife is able to do her own work.

A DAILY CLUB

One need is still unfulfilled. Some men and women patients, too old or disabled to work, and often living alone, are allowed to go on attending the reablement department on two or three days a week, partly to continue with occupational therapy, and partly because they benefit from the company and activity. Dr. Cooksey would like to be able to establish a kind of club for such patients, outside the hospital though linked with it, where they could meet daily, take responsibility for the management, and cook the midday meal. Some of the disabled men, especially, would benefit by this arrangement, for it often happens that their wives, who could otherwise go out to work (and would like to do so, to relieve financial stringency), are obliged to stay at home to look after them. In such a club the disabled could look after and cheer each other. Such a reasonable project deserves success; and other hospitals would doubtless profit from the lead.

A Kitchen for Heart Cases

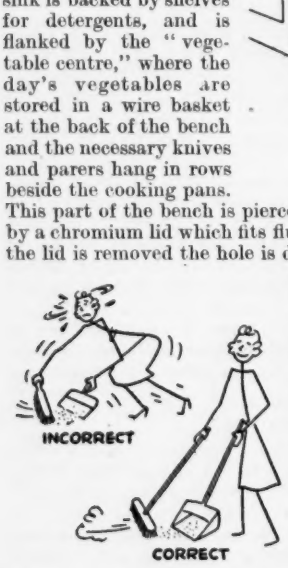
Hearts can be disabled as well as limbs. The American Heart Association has published a booklet [3] designed to

2. *Manchester Guardian*, Nov. 22, 1952.
3. The Heart of the Home. American Heart Association, 1775, Broadway, New York 19, New York, U.S.A. Pp. 28. 10 cents.

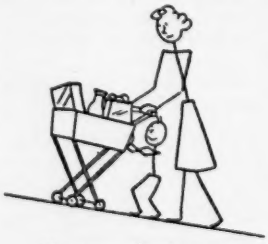
help housewives with damaged hearts to find easier ways of doing their work. Some general advice on planning the work so as to walk and reach as little, and to sit as much, as possible is followed by photographs and descriptions of a simplified kitchen. Tools are hung on hooks, within easy reach of the housewife sitting at the bench, and at the sites where they will be most often used. Materials and supplies are placed on shallow shelves in the same vicinity. Thus at the "mix centre"—the bit of bench which the housewife uses for pastry-making and mixing ingredients—the rolling-pin, spoons, measures, sugar and flour, dried fruits, flavouring agents—are on shelves facing the sitting housewife, all within easy reach; and the pastry bowl is kept on a shelf fixed on the inside of the cupboard door which swings open at her knee. The sink is backed by shelves for detergents, and is flanked by the "vegetable centre," where the day's vegetables are stored in a wire basket at the back of the bench and the necessary knives and parers hang in rows beside the cooking pans. This part of the bench is pierced with a large hole closed by a chromium lid which fits flush with the surface. When the lid is removed the hole is directly over a tall rubbish-bin standing in the cupboard below, and vegetable parings are dropped straight through into it. The can, like the pastry bowl, stands on a shelf on the cupboard door, and when the door is opened the can swings out with it and is easily removed for emptying.

INCORRECT

CORRECT



The "heart" housewife, like Dr. Cooksey's patients, has a trolley for moving plates and dishes, but a very light one. It, too, is the same height as the bench, the oven, and the top of the cooker. Some cupboards in this kitchen are partitioned vertically to hold baking tins and other objects often stacked inconveniently in piles. Everyday china is stored at the right of the sink in a set of shelves open at both sides, like a hatch; thence it can be transferred to the trolley with little effort. Tinned foods and other things used first at the stove (like gravy-browning) are stored, one tin deep, on shallow shelves near the cooker. Small pieces of equipment used for many purposes (like measuring spoons) are duplicated and kept in the various sites where they will be needed. Long-handled brushes and dustpans save the housewife from stooping, and she uses dusting mittens (not so far current in England) which allow her to dust with both hands. Her chair has wheels on the back legs so that she can push it about like a barrow, and when she goes marketing she uses a shopping-cart with a light frame and canvas container to bring home her purchases.



The canvas shopping cart.

AMERICAN PLANNING FOR HEALTH

THE MAGNUSON REPORT

IN December, 1951, President Truman announced that he had signed an executive order creating the President's Commission on the Health Needs of the Nation. The major objective of the commission would be to make a critical study of total health requirements in the United States, both immediate and long-range, and to recommend courses of action to meet those needs.

Less than a year later, on Dec. 18, 1952, the chairman of the commission, Dr. Paul Magnuson, submitted the commission's report and recommendations, and concluded his letter of transmittal with these words: "In all humility we think that this report lays the groundwork for men of good will to unite in a common effort to improve the people's health, the backbone of our democratic strength in a free world."

The report is in five volumes, of which the first embodies the commission's principles, major findings, and considerations.[1]

To investigate and report on the health needs of 155 million people within twelve months is no light task by any standards; and it is first necessary to inquire as to the qualifications of the people who accomplished it.

DR. PAUL MAGNUSON is professor emeritus of bone and joint surgery at Northwestern University, Illinois. The vice-chairman, CHESTER I. BARNARD, is chairman of the National Science Foundation; and the commission includes DEAN CLARK, LOWELL REED, and JOHN GRANT. Of the sixteen members, including chairman and vice-chairman, six are medically qualified; two were dentists (including the late ERNEST G. SLOMAN); one, MARION SHEAHAN, is a registered nurse; and the remainder are laymen. The lay interests are extraordinarily wide, with such people as WALTER P. REUTHER, president, United Automobile Workers; CLARENCE POE, president and editor, the *Progressive Farmer*; ELIZABETH MAGEE, secretary, National Consumers' League; the president of the International Association of Machinists; JOSEPH C. HINSEY, PH.D., dean of Cornell University Medical College; and the president of Fisk University.

METHODS

The commission first assessed, with the help of its technical staff, the total health resources of the country, and then set out to estimate the health needs of the American people. Not surprisingly they found this the most difficult of their tasks. It was accomplished by means of panel sessions, at which more than four hundred experts appeared (the official record of these panels runs to more than two million words), and by eight regional public hearings "at the grass roots," right across the continent from Philadelphia to San Francisco. "The public outpouring at these hearings was so great that a number of them ran two or three hours beyond the scheduled closing time." In addition to individual panels, joint panels, and public hearings, monthly commission meetings were held lasting from two to six days each.

Volume 1 of the report deals with all aspects of the subject under investigation—population, vital statistics,

1. Building America's Health: a report to the President by the President's Commission on the Health Needs of the Nation. Vol. 1: Findings and Recommendations. Washington, 1952.

health personnel, resources and organisation, medical research, finance, special problems, and special population groups. The highlights are the recommendations for the establishment of a Department of Health and Security, and of a Federal Health Commission.

DEFINITIONS

The commission defines health as optimum physical, mental, and social efficiency and well-being; and it emphasises the responsibility of society to assure its citizens access to professional services, education concerning personal health practices, and a reasonably safe environment. "Future accomplishments, however, depend to an even greater degree upon the individual's assumption of responsibility for his own health."

The doctor is defined in the introductory comments as the leader of the over-all efforts, but as one member of a well-trained team composed of dentists, nurses, technicians, and many other professional workers.

DIFFERENCES AND PARALLELS

It is difficult in Britain, still hard-pressed as a result of two world wars, and in straitened economic circumstances, to appreciate the almost adolescent vigour of the American outlook on the future; and this report must be read with two basic facts in mind. First, the population of the United States has doubled in fifty years; and secondly, Americans are still always on the move. Some 4–5 million people move from one State to another in the course of a year, and another 4 or 5 million from one county to another within a given State. Each year over 3·5 million babies are born, and the population is expected to reach 193 million by 1975.

Allowing for differences in outlook it is interesting to see how history tends to repeat itself.

"The high number of rejectees among young men called for military service in World Wars I and II and the present Korean episode have awakened the American people to the fact that despite superior medical service and low death rates, Americans are not enjoying as good health as might be expected in this country."

The commission recommends that the Federal government develop adequate methods to measure morbidity.

HEALTH WORKERS

The report underlines the need for more health workers. The minimum estimate of the physicians needed in 1960 is 22,000 more than the predicted supply, and the commissioners are "alarmed at the progressively severe financial situation of our medical education system." Dental research is an urgent need. Dentists are too few; and the more effective utilisation of dental hygienists and of dental assistants is thought to offer the greatest hope for making dental care quickly available to more people. When the report turns to nursing it sounds a note of anxiety, amounting almost to panic, even though there are now more than 365,000 active nurses, compared with 12,000 in 1900. The shortage in 1960 may exceed 50,000. It is not always easy to understand American nursing trends; for it sometimes seems that graduate nurses are turning away from the traditional concept of nursing and becoming administrators, teachers, and clinical assistants, while bedside nursing appears to be in danger of relegation to the less highly trained. Whether that is so or not, the commissioners believe that nursing should become a part of the general educational system of the nation.

The section dealing with paramedical workers—X-ray technicians, dietitians, physical, occupational, and speech therapists, social workers, hospital administrators, and others—is of particular interest.

"While the several groups of paramedical workers require somewhat different training, there are also basic subjects in which several groups can be trained together. Some universities are already organising schools of 'Auxiliary Medical Services' for the joint recruitment and training of several paramedical groups. This type of program points the way to better training, better use of teaching staffs, and should go a long way in developing workers for the health team."

The report calls for removal of discriminating bars against the training of Negroes in the health professions. Dr. Hinsey expresses his doubts about the advisability of Federal aid in health education, as recommended in the report, with the possible exception of that in graduate schools of public health.

HOSPITALS

The report leaves no doubt as to the place of the hospital.

"Hospitals are at the heart of our modern medical system . . . more and more it [the modern hospital] is becoming responsible for a continuing flow of health services to the community, supplying preventive services in health centers at one end of the line and rehabilitative and home care services at the other end."

The replacement of obsolete hospitals, and especially outpatient units, is urgently needed.

"Today a good hospital is in reality a health center which places increasing stress on preventive and restorative services which keep the patient out of a bed. Home care and rehabilitation services should be developed in association with the hospital, which should have also auditoria for medical and community health organisations, and should possess a fine medical library. Every physician in the community should have some affiliation with a hospital."

ORGANISATION

"The genius for organisation so characteristic of American life in general, is conspicuous in the health services by its absence. . . . In reality most of the American people grope their way through a haphazard array of health services without the guidance of a personal physician."

So begins the section on organisation of health services, and similar frankness is evident in the account of unethical practices which detract from the quality of medical care. Fee-snatching and fee-splitting are touched on, and also ghost surgery—i.e., deception of the patient as to the identity of the doctor who performs an operation.

Regionalisation of health services, and in particular joint use of laboratory, X-ray, and other facilities, is suggested, and also joint purchasing of supplies by a group of hospitals; and it is recommended that Federal loans be made to local organisations wishing to institute prepayment plans associated with group practice. Organised medical bodies are recommended to review their attitude toward group practice in a spirit of tolerance.

The comments on medical research are equally outspoken. "Last year's total expenditure of 180 million dollars amounted to only three tenths of one per cent. of the Nation's defense budget. It was less than the amount spent on monuments and tombstones." The Federal government itself spends over two hundred times as much on military research as on research into heart-disease. Many medical investigators are forced to jump from project to project without any secure underpinning. Research grants should be allocated to all agencies with promise in the health field, not just to medical institutions.

On the thorny question of financing personal health services the commission favours, with proper organisation, the prepayment principle; but it is significant that Walter Reuther, Albert Hayes, and the secretary of the National Consumers' League, dissent. They feel that the objectives set forth throughout the report should be accomplished through a National Health Insurance Act supported by joint employer-employee contributions and tax revenues. Clarence Poe agrees with the

commission's endorsement of the prepayment principle and Federal matching grants to States (on the basis of relative wealth and need), but emphasises the desperate need for prompt action among the rural population of America. Dr. Hinsey concurred in the financial recommendations only if free choice of health personnel and freedom of type of practice were maintained, and a system of remuneration mutually satisfactory to members of the health professions and the public could be devised.

The United States has no unified central health department, and the report reveals some of the reasons for this. They include opposition by the Veterans Administration and the Department of Defense, which fear the dangers to their medical services, and "the zealousness of some of its partisans to give this Department a bigger bite than it can possibly chew in its formative years." The recommendation is brief and to the point: it is that "the Congress establish a Department of Health and Security." Dr. Hinsey again dissented as he considered that the matter required further study. Mr. Graham and Dr. Russel V. Lee felt that there should be a Department of Health with cabinet status but had doubts on extending its function beyond health activities.

SPECIAL PROBLEMS

The report next turns to special aspects of health service, including the expansion of programmes of disease detection, and especially multiple screening; a bold attack on chronic disease to be promoted by the health departments; and the development of home-care services. Research into mental illness must be given top priority, and prevention of accidents a high priority. Also "less time should be spent on perfunctory annual examinations of school children as they are too often performed today," and more time devoted to careful health screening and follow-up.

The report examines the special problems of industrial workers and rural people, including the deplorable conditions of migratory labourers. The problems of ageing, the veterans, the rural Negro, and the Indians are all carefully considered: and the difficulties of drafting doctors, dentists, and veterinarians into the armed forces (obviously a sore point) are recommended for further study.

PROPOSED HEALTH COMMISSION

Finally comes the recommendations that:

1. The Congress establish a Federal Health Commission.

2. Comparable bodies be established in State and local communities.

The Health Commission is to fill the rôle of constant critic and evaluator with an absolutely free hand, while the Federal health department would be primarily an administrative organ of government. The health commissioners should receive no salaries; not more than half the members should be professional health workers, and no member should be an officer or employee of either Federal or State government. The commission should have the power to hold public hearings, and should make an annual report to the President and the Congress on the health status and health needs of the American people, including recommendations for legislation whenever this is indicated.

THE COST

As to the total cost of the recommendations, the Federal government at present spends just over 1000 million dollars each year on civilian health activities. The health programme outlined in this report would require an annual Federal expenditure of approximately 1000 million dollars more.

Parliament

Prevention of Misuse of Drugs

IN the House of Lords on Feb. 12. the EARL of ONSLOW, moving the second reading of the Therapeutic Substances (Prevention of Misuse) Bill, said that its main object was to empower the Minister concerned to regulate the use of new drugs. This applied particularly to isoniazid, a cheap product, which at the moment did not come within the scope of the 1947 Act, and could, if used for self-medication, do great harm. The other purpose of the Bill was to allow the Minister and his colleagues by regulation to permit the use of certain of these drugs, particularly at the moment penicillin, in the feeding of pigs and table poultry.

Lord AMULREE thought that if penicillin was to be fed to pigs, it must be supplied by a veterinary surgeon; otherwise people might buy it for themselves. He also suggested that the Royal Veterinary College should be consulted about any regulations to be made under the Bill when it became an Act. Lord HADEN-GUEST was doubtful whether it was necessary to add the veterinary surgeons to the two well-qualified bodies—the Agricultural Research Council and the Medical Research Council—under whose advice the supervision of the giving of penicillin was to be.

Replying to the debate, the EARL of ONSLOW said the A.R.C. and the M.R.C. were satisfied that penicillin fed to pigs in this form could do no harm. The quantity was so small that it could not affect the consumers of the pig meat. The penicillin would be fed in one of two ways; either in a compound food, where the makers would have to put on the compound a statement of what had been included in it; or in a special mixture—so diluted that it was impossible to extract the penicillin for use in other ways—which the farmer would then be able to mix in his own feeding-stuffs. He was quite satisfied with the assurance that there could not be anything harmful in the admixture in the feeding-stuffs for either poultry or pigs.

QUESTION TIME

Health Services Charges

Mr. ARTHUR BLENKINSOP asked the Minister of Health the number and cost of prescriptions issued, dental treatment provided, and appliances issued, for which charges were imposed under the National Health Service Act, 1952, for November and December, 1952, compared with the figures for November and December, 1951.—Mr. IAIN MACLEOD replied: The following are the figures for England and Wales:

PRESCRIPTIONS

—	Number of prescriptions	Average cost per prescription	Total cost
November, 1951	19,034,911 } actual	46·02*d.*	£3,649,880
December, 1951	17,815,111 } actual	46·58*d.*	£3,457,607
November, 1952	17,439,000 } declared by	Not yet	
December, 1952	20,100,000 } chemists	available	

These figures include prescriptions for appliances ordered by general practitioners and dispensed by chemists, and prescriptions given by hospital outpatient departments and dispensed by chemists. No figures are available to show the number of prescriptions dispensed at hospitals to outpatients.

DENTAL TREATMENT

—	1951		1952	
	Nov.	Dec.	Nov.	Dec.
Number of completed courses of dental treatment under normal procedure (other than for the provision of dentures to which the 1952 Act charges do not apply) *	£ 363,000	£ 388,000	£ 414,000	£ 333,000
Number of courses for limited treatment provided under simplified procedure † ..	236,000	201,000	127,000	102,000
Cost to the Exchequer ..	950,000	1,000,000	850,000	700,000

* Less than half the courses given were subject to charges under the 1952 Act. The remaining courses were started before June 1 or were for items of treatment to which the charges do not apply or were for the exempted classes of patients.

† The courses for limited treatment, which consist largely of extractions of one or two teeth, usually cost under £1 and many patients may therefore be assumed to have had the treatment privately.

APPLIANCES

Surgical Appliances delivered to hospitals

—	1951				1952			
	November		December		November		December	
	No.	Estimated cost	No.	Estimated cost	No.	Estimated cost	No.	Estimated cost
		£		£		£		£
Surgical footwear (pairs) ..	3998	37,000	3996	37,000	3255	28,099	2409	20,625
Repairs to surgical footwear	6739	5000	7588	5700	2598	1763	2036	1304
Surgical abdominal supports*	8328	31,000	8430	31,500	4497	14,452	3511	11,306
Elastic hosiery (pairs or single) ..	3043	5300	3184	5600	2586	4155	2012	3105
Wigs	587	7500	581	7500	381	4830	389	4962

* Includes all types of belts, some of which are not chargeable.

Mr. BLENKINSOP asked the Minister what financial saving he estimated would result from the charges imposed under the Health Service Act, 1952; how much of this saving resulted from a fall in use of the services concerned; and how the savings compared with the estimates originally given.—Mr. MACLEOD replied: The estimated amount of the charges paid, or to be paid, in 1952–53 by patients in England and Wales under the 1952 Health Service Act is about £2 million. In addition, while figures to enable a complete estimate to be made are not available, the reduction in the demand for dental treatment and for hospital appliances for which charges are made compared with the previous year is estimated to show a saving of about £1¾ million. Comparisons cannot usefully be made with estimates framed in the expectation that the charges would operate for a full year and before modifications in the original proposals were made.

Bone-conduction Hearing-aids

In answer to a question Mr. MACLEOD said that a first consignment of bone-conduction hearing-aids had already been sent to the hospitals which distribute aids.

Flour-improvers

Mr. D. W. WADE asked the Minister of Food what progress had been made in the investigations into the existing methods of treatment of flour; and whether he would give an assurance that the process of agenisation would be abandoned.—Major GWILYM LLOYD GEORGE replied: These complex and important investigations into possible alternatives to agene as a flour-improver are requiring considerably more time than was originally thought necessary. They are being pursued with all possible speed, but it would be premature to take any action until they are completed. One or two possible alternatives have been presented, but it is obvious that very careful research must be undertaken before either can be accepted.

Health Service Resignations in Scotland

Sir THOMAS MOORE asked the Secretary of State for Scotland whether he was aware of the public concern in Ayrshire in regard to the efficiency of the National Health Service, with particular reference to the shortage of trained medical and surgical consultants.—Mr. JAMES STUART replied: If the hon. member will let me have particulars of any deficiencies brought to his notice, I shall be glad to consider them.

Sir THOMAS MOORE: While welcoming the Minister's suggestion, is he aware that there has been a disturbing number of resignations lately, especially amongst consultants; and is he satisfied that the West of Scotland Regional Board is adequately and effectively dealing with this unsatisfactory situation? Mr. STUART: I am assured that the regional board are taking proper steps to replace those who have resigned.

Mr. A. C. MANUEL: Is the Secretary of State aware that in the West of Scotland, and in Ayrshire in particular, since the inauguration of the National Health Service we have had a better full-time consultant service than ever previously existed; and that the doctors generally have expressed to me their satisfaction at the better service now available?

In England Now

A Running Commentary by Peripatetic Correspondents

LEISURE, like the conversation that goes with it, is dying; and we are hastening its end. In our fathers' day a whole section of society was dedicated to its pursuit; and none thought a whit the worse of a man for belonging to the leisured classes. But today the very word leisure bears a sting of reproach. Braving public opinion, the Chelsea Clinical Society last week met to hear from three distinguished speakers—a writer, a surgeon and a broadcaster—how we might win our way back to the Pursuit of Leisure. Mr. John Betjeman would have none of this. By speaking for only three minutes he slyly implied that he was making way for others better qualified to talk, and his brief words were largely directed to showing that no stigma of leisure could be applied to him; if, he declared, he liked what he did he wouldn't want any leisure. Leisure was an invention; and here presumably he meant that like other inventions—the safety-pin, the steam engine, and even television—it could be eradicated if only we turned our minds to the task. A similar personal disclaimer came from Mr. Gilbert Harding—the Mr. Harding who in other fields has spoken bravely. Only Sir Heneage Ogilvie stood his ground; but it was carefully chosen medical ground on which he spoke well of leisure as a counterpoise to work. The lesson seems to be that this word is now taboo except in the consulting-room; and we should thank the members of the Chelsea Clinical Society for setting aside some of their less hurried hours to establish this.

* * *

The study of man's reaction to changing environment is now a popular pastime. I have been making an unofficial pilot study of my reaction as a householder to the august body which now runs the local hospital.

The bureaucratic mills grind slowly, but with an air of majestic purpose. The first victims were some moderate-sized houses in which the ci-devant bourgeoisie once raised happy families. These were smartly converted into staff quarters and maternity units, so that our rather ordinary neighbourhood has now a busy professional air. Starched white caps and scarlet-lined cloaks charm the eye in the daytime and ambulance noises make my nights hideous. After a suitable interval a nursing-home was drawn into the net. This raised a generous amount of heat, even assuming atomic proportions, but the deed was not undone and the opposing forces have withdrawn to regroup.

But now a bureaucratic shaft has found a target right in the middle of our domestic hearth. Our invaluable daily help has decided to throw off the shackles of private enterprise and give her services exclusively to the hospital. It would take the genius of Milton to describe the despair with which we contemplate the future of our fast dwindling paradise, and my pilot study has turned a bit introspective. . . .

* * *

During the recent gales our sanatorium was soon cut off from electricity and water. On the first morning of the storm we were approached by a delegation from the patients' club, who, apparently unconcerned about their own welfare, wanted to know what was to happen to their tropical fish. We answered, civilly enough, that we were rather busy just then, and quickly retreated to our quarters to consult our small medical reference library. The fish, some three dozen of assorted species with their young, lived in a tank in a remoter part of the sanatorium property; and the fixity of their internal medium was controlled by a device of science, worked by electricity. The problem was of keeping the temperature of the tank above 75° Fahrenheit under the prevailing chilly conditions. Coal fires in the hospital numbered two, and the tank could not be moved.

On going through our literature, we found we had mislaid Dr. Bernard's paper; other oracles we had consulted in the past could give us no guidance. Our eyes fell on our stone hot-water jar which lay on the floor, where it had been blown out of the hands of a maid-servant earlier that morning. By applying the late Mr. Archimedes's principle, two hot-water jars were

put into the tank without loss of water or fish. A satisfactory rise in temperature was recorded. But darkness was falling and our patients had to go to bed. The bottles needed refilling, if the fish were to survive. There seemed to be no-one available to do this until our Night Sister, in common parlance, "blew in." Scorning the modified polar costume we were wearing, she retired to arrange her cap and cuffs; then, with electric torch held in her teeth, set off with the hot-water bottles, avoiding groaning and crashing trees, to the fish tank. She was later reported to have been anxious lest she inadvertently crush one of the angel fish while inserting the fresh jars.

When our supply of electricity was renewed after two days, it was discovered that there had been one death among the fish, a neon tetra. It was suggested that this might have been due to an overdose of phosphorescent material, self-administered.

* * *

CRI DU CŒUR

One gropes around in darkness, kneeling on the muddy road,
To fix the jack which always slips just as it takes the load.
One prises off the dust-cap and by sundry feats of strength
Loosens the nuts that fix the wheel; one gets it off at length.
By further skill, but mostly force, one levers out the spare;
As like as not one finds it flat so pumps it full of air
And carries it with sighs and grunts and rams it into place,
Pausing but long enough to wipe a red and sweating face.
One finds the nuts and screws them on—they must be screwed on tight—
But cannot find the dust-cap which has vanished in the night.
Repeating strings of awful oaths which one should not repeat,
Blackened with rage and oil and grime one takes the driving seat,
Drives off at speed but two miles on is horrified to find
The wheel so painfully removed was somehow left behind.
A melancholy story—which impels one to inquire:
Why has nobody invented an unpuncturable tyre?

* * *

In a country where many things are changing rapidly, the Uganda Railway is still much the same as when Treves recorded his journey on it in 1910. True it has twice changed its name, but the average speed of its trains is still less than 18 miles an hour, which allows ample time to watch the game animals and the birds which use the telegraph wires as perches.

But it is the stations which provide the greatest source of interest. There the features of many different tribes may be observed, while the scanty clothing permits the observation of many pathological lesions. The children are most easily studied, for many of them still wear no garments. Umbilical herniæ are common, and others have pot bellies on which the outlines of enlarged livers and spleens can be imagined. On our journey we saw one child with the typical gait of congenital hip dislocation and another with severe flexion deformities of the knees. Many natives show scars in which pigment is lacking in comparison to the remainder of their skin, while the eye conditions would provide a feast of clinical material for the ophthalmologist. The garments of the men fail to conceal the fact that hydroceles are still common, as they were in Albert Cook's early days, while there are beggars with deformities which would require further investigation.

Apart from these pathological conditions, the abnormalities wrought by tribal custom are interesting—the stretched lobes of the ears, the loop of which may be turned up and suspended over the apex of the pinna, or else left hanging down perhaps as far as the shoulder; the perforated lower lip of certain northern tribes containing a metal ornament, or the ala nasæ punctured to carry a ring. Finally the custom of smoking a cigarette with the lighted end inside the mouth has to be seen to be believed.

Certainly a fascinating journey, and I, for one, am glad the trains go no faster.

* * *

Nature Note.—The first spring greens of the season evoke the same sort of response from the salivary glands that daffodils do from the spirit. Ours, though looking in the dish like a wreath for Primavera, turned out to taste of nothing in particular. They smelt of nothing in particular too. We were puzzled until we remembered it was because of the chlorophyll.

Letters to the Editor

INTUSSUSCEPTION

SIR,—We feel sure that many will share our disagreement with your leading article (Jan. 31) on intussusception. In the past nine years 378 children with this condition have been seen in the children's department here, and it is from this experience in which we have collaborated that our comments are made.

We agree that the pessimistic statement "clinical statistics on the efficacy of any particular form of treatment are seldom very reliable" has been true for many papers on intussusception; but it need not be so if the type of case, and method of treatment, are carefully defined. From this point of view the term intussusception, by itself, does not take us very far. For valid comparisons we must know the exact ages of the children in the series, the proportion of small-bowel, "boundary," and large-bowel invaginations, and, above all, the duration of the symptoms when treatment was applied.

When these factors are comparable we find that both surgical reduction, and enema reduction combined with surgery when necessary, will be equally successful provided the operator in each case is thoroughly experienced in the technique employed. This proviso of course has important professional and administrative implications which we cannot take up here.

As early as 1937 Hipsley,[1] using saline-enema reduction as his first approach, achieved a mortality of 4%. A comparison with those series managed by surgery which were available at that time, suggested the undoubted superiority of Hipsley's method. A careful scrutiny of his paper, however, supplemented by personal inquiry, showed that the majority of his children were admitted within the first twenty-four hours of the disease. This early admission also applied to the careful series using barium enema reduction under direct vision described by Nyborg,[2] and by Hellmer.[3] On the other hand, our own mortality with surgical reduction has always been less than 4% for cases admitted within twenty-four hours; and in 1951 and 1952, for acute cases (i.e., cases admitted in under five days) the over-all mortality has been just over 1%. An account by one of us (J. D. T. J.) of the children treated during this two-year period is at present awaiting publication. The reasons why the mortality has fallen from 10% to 1% over the nine years, seem to us clear and important. Firstly, in 1944 (excluding chronic intussusception) only 31% of the children reached hospital within twenty-four hours and 48% in forty-eight hours: whereas in 1951 and 1952 the figures were 54% and 85%. Secondly, operation is always preceded by the careful correction of shock and fluid loss. Lastly—and this represents a significant change from our last communication on the matter in 1950[4]—the surgery of intussusception is now confined to a small number of surgeons who are giving much of their time and thought to the emergency surgery of childhood in this hospital.

This brings us to our second major criticism. You say: "there seems to be no particular advantage in the Mickulicz type of two-stage exteriorisation procedure"; but during 1951 and 1952 bowel resection was carried out in 9 children with acute intussusception with only 1 death. Although we have not used the classical Mickulicz type of operation, all these resections were carried out by a two-stage procedure. Our reasons for favouring this method will be given in the forthcoming article already mentioned.

We must also take issue with the phrase "the inconstancy of symptoms." We find that where careful

1. Hipsley, P. L. *Surgery*, 1937, **1**, 825.
2. Nyborg, S. *Acta chir. scand.* 1943, **89**, 1.
3. Hellmer, H. *Acta radiol., Stockh.* 1948, suppl. 65.
4. Spence, J., Court, D. *Brit. med. J.* 1950, **ii**, 920.

attention is paid to the story and close observation made of the ways in which children react to pain, intussusception is one of the most clearly defined conditions in childhood. Certainly textbooks often give a misleading mixture of symptoms drawn from different stages of the disease; but on the first day—the period when it must be suspected for optimum results—the clinical picture is plain and the fringe of atypical cases is small. The onset is sudden; vomiting occurs in 9 out of 10 children; and blood is passed spontaneously by about half the children on that first day. Pain is always present, though we admit that sometimes it requires considerable experience to recognise it, as it will be expressed by different children in different ways. In many the traditional screaming occurs with each bout of colic; in others it is reflected in crying more often than usual; others again are exceptionally restless with whining and whimpering; while very rarely the child may simply blanch with the spasms without uttering a sound.

With proper sedation an experienced observer will feel the tumour in almost every case, except when the invagination is still confined to the small bowel; and although it is true that it is easier to feel the tumour when the bowel is in spasm, we do not agree that the tumour disappears when the bowel is relaxed. As regards surgical technique, a right paramedian incision is, in our opinion, superior to an incision in the right iliac fossa; and experience has shown that in the younger children there is no need to remove the appendix. We can certainly see no reason for the use of a combined technique of enema reduction plus laparotomy as used by Collier.

We would stress again the constancy of the clinical picture of this disease, apart from feeling the abdominal tumour, because it is upon this that we must rely if the family doctor is to suspect it with increasing frequency within the first twenty-four hours. What is more, this very constancy makes diagnostic radiography unnecessary and time-wasting except in the few subacute or chronic examples of the disease.

We hope to present our material, and with it the difficulties of this subject, more fully at a later date; but we felt that your article called for an immediate reply.

J. D. T. JONES
DENIS HINDMARSH
S. D. M. COURT
R. H. JACKSON.

Children's Department,
Royal Victoria Infirmary,
Newcastle upon Tyne.

REGISTRATION OF FEVER NURSES

SIR,—Dr. Grant's letter last week draws attention to a matter which is causing great anxiety to those concerned with the staffing of fever hospitals.

The General Nursing Council maintains that it is concerned solely with the training of nurses and not with the staffing of hospitals, but surely it can be argued that the training of nurses should be related to the nursing services required by the public.

There has been a large drop of infectious diseases over the last ten to fifteen years, but the work carried out in a modern fever hospital is still a very essential part of the health service. Much of the work consists in the treatment of acutely ill babies, and this requires possibly greater nursing skill than any other form of treatment. In a large city there is always the risk of serious epidemic disease—only a few years ago we had to treat over a hundred cases of paratyphoid fever in this hospital. The danger of poliomyelitis is an urgent one, and the recent outbreak in Copenhagen makes one view with concern any move which would lead to a precarious state of staffing in our infectious-disease hospitals. Even diphtheria is not completely absent; in the last two months we have treated ten clinical cases, including one fatal case. A too-ready belief that infectious diseases are now of little account from the nursing point of view may lead us into danger.

It must be admitted that many fever hospitals are too small to offer suitable training for nurses, but this is no reason for abolishing the two-year training course in infectious diseases in the larger hospitals where student nurses can gain a wide variety of excellent experience.

If the Fever Register is abolished the infectious-disease hospitals will face grave difficulties.

A. B. CHRISTIE
E. A. BURNS.

Fazakerley Hospital,
Liverpool.

AUGMENTED RESPIRATION

SIR,—I wish, without intending to depreciate the work of Mr. Donald and Miss Lord, to comment on a statement in their letter last week which has a wider relevance.

They claim that the negative pressures used in their respirator encourage the return of blood to the heart, and I think they mean to contrast the effect of inflating the lungs by pressure applied through the air-passages. This notion is widely held, but it is mistaken. The negative pressure exerted by a Drinker-type respirator does not enhance cardiac filling, because it is applied to the limbs and abdomen as well as to the thorax. In fact, the distribution of pressure gradients (and hence the circulatory effects) is identical with that produced by applying a similar, but positive, pressure through the air-passages. We have in this department recorded the blood-pressure during artificial respiration and have confirmed that lung inflation, whether by negative external or positive internal pressure, drops the stroke volume, whereas, of course, normal inspiration increases it.

The practical inference is that, the circulatory and other physical effects of the two modes of artificial respiration being the same, the choice between them may be made on grounds of convenience.

A. C. DORNHORST.

Department of Medicine,
St. Thomas's Hospital Medical
School, London, S.E.1.

CHILD-WELFARE CLINICS

SIR,—When considering the future of the child-welfare clinics a few facts must be borne in mind. They are:

1. The most suitable person to do this work is undoubtedly the family doctor.
2. There is no official barrier whatever to prevent him from doing this work now; for in most areas some interested doctors have their own clinics, and some of course have national reputations in this field.
3. Local authorities do this work for the undeniable reason that in the past general practitioners have neglected to do it.

It is quite impossible for the local authority to staff and equip an infant-welfare centre for every family doctor; for instance, in Ilford there are fifteen centres and about seventy general practitioners. It would be equally inappropriate to select fifteen of these seventy and ask them to look after children on the lists of other doctors.

A large number of practitioners cannot or do not wish to do this work because they are not interested or their premises are unsuitable.[1] We have all seen queues in the rain outside their surgeries in industrial towns and know how crowded the waiting-rooms must be and how they may often be filled with unsuitable fellow-patients, such as open cases of tuberculosis.

Accordingly, until such time as most family doctors are interested in health education and have suitable premises for this work (such as may be provided in health centres) the local authority must continue to provide this service. When these conditions are fulfilled, local-authority infant-welfare centres will disappear for the simple reason that they will not be wanted.

Should they be precipitately discontinued there is no doubt that the vast majority of children—say,

1. See Collings, J. S. *Lancet*, 1950, 1, 555.

75%—will be completely denied this type of service. Theoreticians who do not realise the practical consequences of such an action may be compared with those who have in recent years exacerbated the problem of the care of the aged by decreeing that, as every aged person can have his own doctor and hospital services are free, there is no further need for the relieving officer or compulsory financial responsibility of relatives. A similar devastating error was the cause of the partial collapse of the priority dental services, when dental attention was made available to all even though the priority dental services were given special mention in the National Health Service Act itself.

Finally, as some of your correspondents have pointed out, in the interests of social medicine it is surely necessary that the family doctor should, as his name implies, look after all members of the family; and to introduce a special type of pædiatrician general practitioner who would remove the child from the care of the family doctor would be a most retrograde step.

I. GORDON
Ilford. Medical Officer of Health.

COLLEGE OF GENERAL PRACTITIONERS

SIR,—The undersigned general practitioners met informally on Jan. 14 to discuss the implications for Irish doctors of the report of the General Practice Steering Committee [1] and the subsequent foundation of the College of General Practitioners in London.

It was unanimously agreed that these developments were of considerable importance and that a meeting representative of all general practitioners should be called in the near future in order to have the fullest discussion on the subject and to decide upon a unified line of action. Through the courtesy of the authorities of University College, Dublin this meeting will be held in the college on March 15.

This promises to be the most important meeting ever held in this country in relation to general practice. We hope that it will be attended no matter what the personal inconvenience not alone by all those already working in this branch of medicine whether as dispensary doctors, private practitioners, or in any other circumstances but also by the newly qualified men and women intending to make general practice their career.

It may be useful for those attending if some of the points raised at the preliminary discussion are mentioned here. Irish practitioners have four choices in relation to the new college:

(*a*) Individuals having the necessary qualifications may join as members or associates.
(*b*) An Irish faculty of the new college may be formed (the method of doing this is being investigated).
(*c*) An independent Irish college may be formed.
(*d*) They may do nothing.

The signatories of this letter feel that some definite step must be taken to ensure that Irish general practitioners may be enabled to secure full reciprocity with their opposite numbers in England and that nothing should be neglected which would tend to maintain the status of the general practitioner.

It is scarcely necessary to point out that the field of medicine embraced by the term "general practice" has narrowed very considerably in recent years and that many G.P.s find themselves dealing only with the clinical trivialities while patients whom they could well treat gravitate elsewhere.

In the opinion of most general practitioners there is room for great improvement in the training of medical students; for, while the great majority are destined to enter general practice, they are never taught however briefly by a general practitioner, and rarely if ever see the run-of-the-mill cases which make up a G.P.'s round and are first introduced to the G.P. the hard way—hard alike for the newly qualified doctor and his patients.

There is no intention among the undersigned that any new group, college, or faculty formed shall be a competitor or rival of existing institutions, but rather that it shall be a co-equal partner with the object of improving the professional status of the general practitioner secondary only to the maintenance of high ethical and clinical standards in the profession as a whole.

We appeal most earnestly for a full attendance of our colleagues in University College, Dublin, on Sunday, March 15, at 11.30 A.M.

DESMOND CARNEY	JOHN FLEETWOOD
D. S. KEARON	JOHN J. MCCANN
NORA MCNALLY	LAURENCE MASTERSON
ANDREW E. H. O'BYRNE	J. ST. L. O'DEA
J. F. O'GRADY	ROBERT O'MEARA
E. A. O'REILLY	A. RYAN.

1. *Brit. med. J.* 1952, ii, 1321.

DAILY PAPER PANTHEON

SIR,—I should like to congratulate you on "Daily Paper Pantheon" in your issue of Jan. 31. As doctors we can count nothing human as alien and any clues to the discontents of our time must be specially welcome to us.

If, as Dr. McGlashan says, "the gods" are inevictable tenants of the human heart, how foolish have been the intelligentsia of the West in rejecting, and in persuading popular fashion to reject, that most profound and evocative version of the story of the paradoxical hero which is its religious heritage.

My own conviction of the truth of Christianity does not derive from its correlation with the universal common denominator of the basic spiritual needs of mankind, but the fact is of great value for apologetics. It is difficult to think too hardly of those persons who, in pursuit of a false simplicity and an allegedly higher concept, have tried to purge Christianity of its supernatural elements and have thereby done more to render it unattractive to the masses than all the atheists and unbelievers in frank opposition.

Darlington. JOSEPH V. WALKER.

PARONYCHIA

SIR,—May I reply to some of the points raised by correspondents following the publication of my article (Jan. 17).

I am sure that Dr. Wheatley (Jan. 24) is right when he suggests that usually paronychia can be—and is—aborted in general practice by the early exhibition of penicillin. Sepsis of the hand can nearly always be aborted by the *early* exhibition of penicillin, because it is almost invariably due primarily to infection by sensitive organisms. Such treatment must be very early in some cases, because in the subcuticular type of paronychia spread may be very rapid; and occasionally twenty-four hours is long enough for a case to become out of reach of conservative measures. Once pus forms the situation changes, and surgery is indicated—as it always has been. Nowadays, however, operation on an abscess is incomplete if the only object is to "let pus out." Operation is also aimed at letting the antibiotic in, and this is a second principle which should activate the modern approach to minor surgery. Failure to appreciate this is at the bottom of many so-called "resistant" infections.

The routine dosage of penicillin is that referred to by Ellis.[1] We have not tested our organisms against chloramphenicol and penicillin mixed together, so I cannot comment on this; but I cannot endorse

1. Ellis, M. *Lancet*, 1951, i, 1038.

Dr. Wheatley's suggestion that penicillin and streptomycin should be applied locally. Topical streptomycin is particularly liable to produce skin reactions, and topical penicillin is not free from the same disadvantage. I have not yet seen a skin reaction with chloramphenicol. 5% chloramphenicol in propylene glycol is not expensive; 100–150 applications cost 8*s*., if the solution is made up in one's own dispensary. The total cost in antibiotics of treating a case of paronychia was 3*s*. 7*d*.; it is now less.

Mr. Jones's investigation of seasonal variations (Jan. 31) interested me greatly. I agree there are so many factors that it is difficult to prove anything. I have, however, taken from last year's records on septic hands (976 cases) a few figures which may be relevant.

In the months January, February, March, October, November, and December, 58 cases of common septic hand conditions took over a fortnight to heal, 21 over three weeks, and 10 over a month. In the months April–September the corresponding figures were 26, 10, and 4. The figures for paronychia were: over a fortnight, in the winter 18 and in the summer 4; over three weeks, in the winter 4 and in the summer nil; over a month, in the winter 2 and in the summer nil.

It is the *clinically* resistant cases that we hope to abolish. Some, as I have shown, are due to bacteriological resistance, and chloramphenicol will help. Many are due to faulty surgery in the first place, and bacteriological resistance is acquired secondarily. Paronychia is the first septic condition of the hand in which penicillin-resistant organisms have been noted in significant numbers on first attendance at the clinic.

This casualty appointment, like many others, has been unfilled for some time; and in the past year no less than seventeen housemen have been detailed, at one time or another, to operate on the cases. Under such conditions it is impossible to maintain a consistently high standard. Nevertheless the 230 cases of paronychia treated since the principles I adopted have been emphasised, have had an average duration of treatment of 7·1 days. This is nearly a 40% improvement on anything we have had before, and exactly half the average disability in 1950.

Royal Infirmary, Sunderland. T. G. LOWDEN.

A SURGICAL POLICY FOR PEPTIC ULCER

SIR,—May I congratulate Mr. Orr and Mr. Daintree Johnson on their excellent article in your issue of Feb. 7? They have recognised the surgeon's dilemma: excellent as ulcer surgery is, a fairly high resection is necessary for sure relief, and the higher one goes the more likely one is to encounter untoward effects (of which we have seen examples from all over the country). The authors' plan of operation is designed to secure the benefits of gastric surgery without its disadvantages.

In my own clinic we treated a small series of patients by limited gastrectomy with vagotomy, and we were well pleased with the results, but we are waiting a little longer before going on. Meanwhile, we are giving an extended trial to another promising procedure, the results of which have not yet been assessed for publication. These latest figures from Mr. Orr and Mr. Johnson are a strong encouragement to us to begin a second series of limited gastrectomy with vagotomy in suitable cases.

It is only from the most careful personal analysis of an adequate series of cases such as this, that any important deductions can be drawn. The authors mention that they have also had access to a second series, operated upon by a colleague. I should like to emphasise the value of this method in which the same observer takes stock of both series and can therefore safely draw comparisons. We also have made a start in this direction, and we hope soon to extend similar inquiries much more widely.

Finally, may I voice one criticism? I believe they are wrong in supposing that even the most cunning questionnaire is as good as an interview: for example, the signs of riboflavine deficiency have to be looked for if they are not to be missed. Moreover, patients who have, through surgery, been relieved of their life-long ulcer pains are often reluctant, unless pressed, to admit to even so gross a feature as bilious vomiting, and, moreover, they often mistake bile for food. In this article, the incidence of bilious vomiting is about "right," but that of the vomiting of food seems to me too high.

Department of Surgery, University of Liverpool. CHARLES WELLS.

METHOD OF ADMINISTERING DICOUMAROL

SIR,—The paper by Dr. Bjerkelund (Feb. 7) was very interesting to us here as, for some years, the determination of prothrombin levels and the task of working out further dosages of dicoumarol or of ethyl biscoumacetate ('Tromexan') has been entrusted to the biochemist. This arose because the requests were often inscribed "please advise dosage of anticoagulant," and also because we found commonly that inexperienced housemen either were reluctant to order enough dicoumarol or ordered excessive amounts. Furthermore, daily prothrombin estimations were becoming a burden to both staff and patients. Consequently the following scheme was devised:

The initial request form contains full clinical details, including any dosage already given. The prothrombin is determined by Quick's one-stage method using rabbit-brain thromboplastin, and the result is reported as the index and corresponding percentage normal. This is written direct on to the request form together with dosage details for the evening of the day of test, the following day or days, and the morning of the next test day. The form then goes back to the ward; or in the case of outside hospitals in the group the report is telephoned. Usually tests are done every other day—chiefly Mondays, Wednesdays, and Fridays.

The advantages are briefly:

1. The report gets to the ward quickly and treatment can be started with little delay.

2. There is no laboratory office work except to note incoming requests in the day-book; there is no typing (to save technical time, the report is written within a rubber-stamp framework), and we keep our own record of the dosages in the laboratory prothrombin-time book.

3. Tests are necessary only every other day.

4. In the case of ethyl biscoumacetate, the dosages are divided into morning and evening tablets, and usually one 300 mg. tablet is given at 6 A.M. on the day of test to maintain a satisfactory level until the result of the test is known.

5. Whilst it might be argued that it is unwise to leave the dosage to the laboratory, in practice this works very well; for the biochemist, unlike the houseman who has many such drug dosages to work out, can bring a fresh mind to the problem. Furthermore, it is obviously an asset to have someone who has been concentrating on this dosage problem for several years and who has the patient's previous figures at his finger-tips. Indeed, provided full clinical details are given, it is possible for the laboratory to point out the inadvisability of starting a course of ethyl biscoumacetate in, for example, pregnancy, if this has been overlooked by the clinicians.

6. General practitioners are more ready to treat their own patients instead of admitting them to hospital. In the case of ambulant patients the blood is taken by the laboratory, the result and dosage telephoned to the doctor, and the dosage alone telephoned to the patient. The doctor then has merely to check the clinical side every other day. He knows what dosage the patient has been instructed to take, and can alter it if he considers this necessary. This is surely a good example of a general practitioner receiving immediate and full coöperation from a hospital department and yet maintaining full control of the patient.

7. Only two cases of major hæmorrhage in the past four years can be recollected. One was in the early days, through too infrequent testing, and was controlled by transfusion.

The other was in an old lady who had had a ureteric transplantation and a hysterectomy; she had only one kidney, which was subsequently found to be riddled with chronic nephritis, so the fatal hæmorrhage which ensued was not surprising. This emphasises the need to include full clinical details on the request form.

Dr. Bjerkelund pleads for "long-continued treatment of ambulant outpatients." Surely the danger of recurring thrombo-embolic incidents could be substantially reduced if the patient were maintained on ethyl biscoumacetate for longer than is now customary. We cheerfully subject people to lifelong liver and insulin injections with accompanying laboratory control, and yet we are reluctant to do the same in the case of dicoumarol or its derivatives. If a dosage advisory service could be arranged on the lines indicated above, most of the principal objections to the use of this drug would be overruled. Is it not worth it?

Royal Infirmary, Preston. E. B. LOVE.

HALLUX VALGUS

SIR,—Your leader last week stimulates me to make certain observations on this important subject.

Apart from terminal-phalanx hallux valgus, which is congenital, hallux valgus is, I understand, found among peoples who have always been barefoot only in adults; and the disorder appears to be due to injury of the first metatarsus or proximal phalanx. Developmental hallux valgus is, I believe, virtually unknown among children who have always been barefoot.

Since in this country some 50–75% of adolescents have a developmental hallux valgus (as any school medical officer will testify) only some all-embracing factor, such as tight shoes, can be involved. Again, since our Ealing shoe scheme showed quite clearly among growing children that the supply of well-fitting shoes leads to the disappearance of hallux valgus, it is difficult to accept your assumption that "there is commonly no apparent cause whatever for hallux valgus."

The child with a broad foot needs no wide metatarsal angle to have difficulty in finding suitable fittings in footwear; and children's shoes at a price within the reach of the ordinary parent are made in only one fitting. At least half the children could not therefore possibly obtain satisfactory shoe fittings even if there were enough trained shoe-fitters in the shops and every parent were aware of the importance of securing correct fittings. Every child needs a new fitting approximately every three months, but with shoes at their present cost it is almost impossible for parents to follow this practice.

How sad it is that this preventable condition is not prevented!

Ealing. W. G. BOOTH
Medical Officer of Health.

CONGENITAL DEFECTS FROM MATERNAL RUBELLA

SIR,—Mr. Ian Robin [1] recommended that, in order to avoid danger of infection with rubella during pregnancy, every opportunity should be taken to infect girls with the disease before leaving school. I am in absolute agreement, and there seems every advantage in following such a course in a school where all the girls are boarders. But, as medical officer to a girls' public school in which only 153 of the 521 girls are boarders, I find the decision by no means so simple. Some of the girls may be returning daily to a mother who may herself be pregnant, or they may share public transport and entertainment with pregnant women; the risk would therefore be spread over a large section of the community. I should welcome the views of others who may be faced with the same problem.

Northwood, Middlesex. DUDLEY M. BAKER.

1. Robin, I. G. *Lancet*, 1952, ii, 1034.

EXAMINATION OF RIB BONE-MARROW FOR TUBERCLE BACILLI

SIR,—The discrepancy between our findings and those of Dr. Marsh and Mr. Barton,[1] who found no tubercle bacilli in the rib bone-marrow of their patients, may be explained by the following facts:

(1) The hæmatogenous (disseminated) form of tuberculosis is commoner in children.

(2) The sternum is relatively richer in marrow than the ribs.

In our work on this subject we have made comparative studies of blood, bone-marrow, and gastric-juice cultures from tuberculous children, and these have confirmed our previous results. This study encouraged us to make a more detailed review of the literature, and we have found that the bone-marrow of tuberculous patients has repeatedly given positive results in the past.[2–5]

University of Athens. K. CHOREMIS.

THE LATE Dr. H. W. DIAMOND

Dr. J. B. Wrathall Rowe writes: "Dr. Hugh Welch Diamond, who died at Twickenham in 1886, was a pioneer in the field of medical photography and photomicrography. I should be grateful if anyone with knowledge or early examples of Dr. Diamond's work would write to me c/o the Medical Department, Kodak Ltd., Harrow, Middlesex. I should also welcome information about Dr. Diamond's descendants: Dr. Warren Hastings Diamond may have been his son, and he is thought to have had a grandson named R. Hugh Clarke."

Medicine and the Law

Nationalised Hospitals and Negligence

THE degree (if any) to which the nationalised hospitals and their staffs are protected from claims for negligence is still being worked out at the expense of plaintiffs and defendants. In Bullard *v.* Croydon Hospital Group Management Committee and Latta [6] it was alleged that a patient suffering from acute appendicitis was not operated upon till five days after admission to hospital; by that time, it was said, peritonitis had developed and death occurred on the day of the operation. A claim for damages was brought against the hospital managers and the surgeon concerned. The hospital managers replied that, in so far as they were responsible for the treatment of the deceased, they undertook it as their duty under the National Health Service Act; the surgeon, they contended, was acting on their behalf or as an officer under their direction in the discharge of their responsibility, and they claimed protection from liability by virtue of section 72 of the Act.

Section 72 provides that section 265 of the Public Health Act, 1875, shall have effect as if the public authorities referred to therein (local authorities, joint boards, and port sanitary authorities) included a hospital management committee. Section 265 provides that nothing done by such authorities or any of their officers or other persons acting under their directions, "if the . . . thing were done . . . bona fide for the purpose of executing" [the Act of 1875], shall "subject them . . . personally to any action, liability, claim or demand whatsoever."

Mr. Justice Parker decided in favour of the plaintiff, the administrator of the deceased patient's estate. He referred to section 13 of the 1946 Act which states that hospital management committees, notwithstanding that

1. Marsh, K., Barton, G. E. *Lancet*, 1952, ii, 1059.
2. Debré, R., Lamy, M., Sée, G., Mallarmé, J. *Pr. méd.* 1936, **44**, 1853.
3. Even, R., Lecoeur, J., Sors, C. *Bull. Soc. Soc. méd. Hôp. Paris*, 1947, **63**, 113.
4. Bernard, E., Kreis, B., Lotte, A. *Ibid*, 1949, **65**, 360.
5. Katz, S., Lifschutz, S. *Med. Clin. N. Amer.* 1950 **34**, 1817.
6. *Times*, Feb. 13, 1953.

they may be exercising functions on behalf of the regional hospital board, "shall . . . be liable in respect of any liabilities incurred (including liabilities in tort) in the exercise of those functions." He was not to be convinced that, when section 13 plainly said that hospital managers could be liable, section 72 would prevent them from being sued. He had been pressed with a Scottish case (Davis *v.* Glasgow Victoria Hospitals) in which it was decided in 1950, on the corresponding but not identical enactments relating to Scotland, that the hospital management could not be sued. The Scottish case, he said, was not binding upon him. On the preliminary point of law, therefore, the plaintiff has succeeded; but leave to appeal has been granted. It is not a matter which should be left in doubt.

Public Health

Mortality in the North of England

THE Registrar-General's Statistical Review of the year 1950 [1] drew attention to the high mortality-rate in the north of England as compared with the south. Dr. C. Metcalfe Brown, medical officer of health for Manchester, has now put before the city's health committee an analysis of the mortality figures in the Manchester area, in which he has compared them with those from other parts of the country and drawn some conclusions about the causes of the difference between north and south. He has used as illustrative figures the adjusted mortality ratio and the infant-mortality rate, which, provided areas of large enough population are considered, generally agrees with the mortality ratio when different areas are being compared.

The report sets out some examples which show that, as judged by mortality-rates, the healthier parts of the country are in the south and the least healthy in the north-east. Details are then given for those districts of Lancashire and Cheshire which adjoin Manchester, Salford, and Stockport. The parts to the south show up best—most of the county districts of Cheshire have a lower adjusted mortality-rate than that of England and Wales as a whole. But most of the county boroughs to the north have a mortality ratio close to the Manchester figure of 1·22. Along the railway line which approaches Manchester from the south-west, through Hale, Altrincham, Sale, and Stretford, the mortality ratio and the infant-mortality rate show a steady turn for the worse, the infant rate rising from 8 per 1000 live births at Hale to 37 in Manchester. Atmospheric pollution increases considerably along the same railway line, factories and workshops become more numerous, the houses crowd more closely together, and living conditions deteriorate.

Dr. Metcalfe Brown sums up the disadvantages of the north as follows:

(1) Lower temperatures.
(2) Less sunshine and daylight.
(3) Greater atmospheric pollution.
(4) Greater congestion of houses.
(5) More defective houses.
(6) More intense industrial development.
(7) Heavier industrial occupations.

He lays the chief blame for the higher mortality-rate in the north on poor housing, industrialisation, and smoke pollution; and to these he adds the high proportion of unskilled workers in the population.

"Industry needs the highly skilled craftsmen but it also needs and attracts the unskilled workers. Many of these labourers are people of high intelligence but some are not. They have not acquired the skill and greater prosperity of the craftsmen because of one or more factors such as lack of opportunity, ill-fortune, lack of ambition which is not necessarily reprehensible or physical or mental incapacity. They are not, with notable and frequent exceptions, so enlightened or educated as a skilled worker in many matters, and one of the most important of these is healthy living. They and their families tend to occupy the worst houses of the town because they are cheaper and they have learned, and in many cases have been compelled, to put up with bad conditions. Perhaps they may have never had the opportunity of knowing any other. Their wage level is the lowest in the community and that, together with the other points as well as their poor environment, has resulted in a standard of life lower than that of the rest of the community. And there they will stay unless they are helped."

There is no complete remedy within the foreseeable future, Dr. Metcalfe Brown concludes, but the greater part of the problem can be attacked by building better homes, by planning towns to avoid congestion, by improving working conditions still further, by promoting health education, and by curtailing atmospheric pollution.

1. See *Lancet*, 1952, ii, 1223.

Influenza

Deaths from influenza are still on the increase: in the 160 great towns of England and Wales there were 446 deaths in the week ended Feb. 7, compared with 313, 132, and 72 in the three preceding weeks. The majority of deaths were again in London and the south-eastern region, where 270 people died as against 219 in the week ended Jan. 31. There were slight increases in all the other regions with the exception of the eastern region; but there is still no evidence of any serious spread to the north, and the disease continues in its mild form. The number of first claims for sickness benefit submitted to the Ministry of National Insurance decreased in most regions, including London, in the week ended Feb. 10, though there were slight increases in some parts of the north, the midlands, Wales, and Scotland. The epidemic is discussed in an annotation on p. 383.

The epidemic has fallen heavily on a number of schools in and around London.[1] At one stage Eton had 300 of its 1160 boys ill, and at Tonbridge more than half the boys were affected, but the outbreak is now subsiding.

1. *Daily Telegraph*, Feb. 17, 1953.

Appointments

CHAYTOR, R. G., M.B. Durh., D.L.O.: consultant E.N.T. surgeon, hospitals in Newcastle upon Tyne and Gateshead H.M.C. groups.
DISON, GERALD, M.C., L.R.C.P.E., D.OBST., D.P.H.: asst. administrative M.O.H., Birmingham.
KALINSKY, SIDNEY, M.B. Lpool: whole-time tuberculosis M.O., North Liverpool area.
McDOUGLE, H. A., M.B. Edin.: asst. anæsthetist (S.H.M.O.), Hull "A" and East Riding groups.
MARKS, K. L., M.B. Edin., M.CH. ORTH. Lpool, F.R.C.S.E.: whole-time asst. orthopædic surgeon, hospitals in the Chester area.
PEGUM, J. S., M.A., M.D. Camb., M.R.C.P.: physician to the skin department, London Hospital.
PERRIN, JOHN, M.B. Camb., M.R.C.P.: asst. director to clinical laboratories, London Hospital.
RICE-OXLEY, J. M., M.A., D.M. Oxfd, M.R.C.P.: consultant physician, hospitals in Chesterfield, Worksop, and Retford.
WATKINS, P. F. A., M.R.C.S.: area M.O., Swindon (British Railways, Western Region).
WELLS, C. E. C., M.B. Lond., M.R.C.P.: medical registrar, Southmead Hospital, Bristol.
WHITEHEAD, J. P. S., M.R.C.S.: asst. pathologist (S.H.M.O.), Scarborough, Bridlington, Malton, and Whitby group.

Colonial Service:

DANSEY-BROWNING, G. C., M.R.C.S., D.O.M.S.: ophthalmic specialist, Hong-Kong.
DASENT, L. E., M.B.: M.O. Grade C (late student), Trinidad.
DAS GUPTA, P. R., M.B., F.R.C.S., D.L.O.: M.O. (E.N.T.), British Guiana.
KENT, P. W., O.B.E., M.B., D.P.H., D.T.M. & H.: special grade M.O., Kenya.
McLAREN, D. W., M.B. Durh., D.T.M.: senior M.O., Nigeria.
ONWU, S. E., M.B. Edin., D.T.M. & H.: D.D.M.S., Eastern Region, Nigeria.

Dublin Corporation Tuberculosis Service:

CALLAGHAN, BRENDAN, L.R.C.P.I., D.P.H.: asst. M.O.
FLANAGAN, J. J., M.B. N.U.I.: asst. M.O.
McDONAGH, ANNA, M.B. N.U.I.: asst. M.O.
WALSH, BRIDGID, M.B. N.U.I.: asst. M.O.

Births, Marriages, and Deaths

BIRTHS

EWING.—On Feb. 11, at Hammersmith Hospital, Ducane Road, W.12, to Phyllis (née Parnall), wife of Mr. Maurice R. Ewing, F.R.C.S.—a brother for Hamish.
RIGBY.—On Feb. 5, to Joan, wife of Dr. J. P. V. Rigby, of Huntsmoor Weir, Cowley, Middlesex—a daughter.
TURNER WARWICK.—On Jan. 21, at Middlesex Hospital, to Margaret (née Harvey Moore), M.R.C.P., wife of Richard Turner Warwick, F.R.C.S.—a daughter.
WOLLNER.—On Feb. 8, at The Churchill Hospital, Oxford, to Sylvia Wollner, M.B. (née Colquhoun), wife of Leopold Wollner, M.B.—a son (Mark Edward).

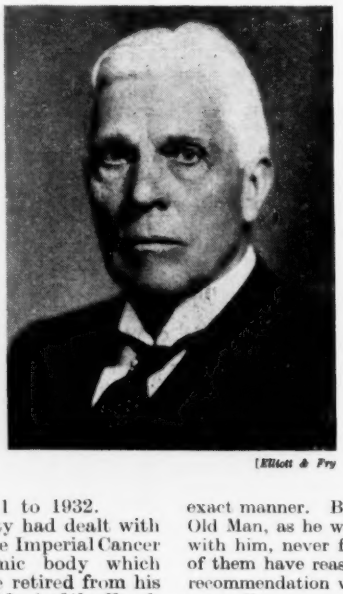
Obituary

HOLBURT JACOB WARING

Bt., C.B.E., M.S., B.Sc. Lond., D.C.L. Durh., LL.D. Brist., M.S. Cairo, F.R.C.S., F.R.A.C.S.

Sir Holburt Waring, whose death we announced last week, made important contributions to medical education. On the ward round and in the operating-theatre he was a stimulating teacher; in the hospital board room he was a generous and forceful advocate of expansion; and in the counsels of the Royal College of Surgeons, the University of London, and the General Medical Council he initiated reforms in the medical curriculum.

Born in 1866, the son of Isaac Waring of Southport, he was educated at Owens College, Manchester, and at St. Bartholomew's Hospital, from which he graduated M.B. with honours in 1890. In the following year he took the F.R.C.S. and in 1893 he obtained the M.S. and the gold medal for surgery. Meanwhile in a succession of house-appointments at Barts he had quickly won recognition, and appointment to the staff and to the lectureship in operative surgery followed in due course.



[Elliott & Fry

On the outbreak of war in 1914 as a Territorial he was at once called up, and with the rank of lieut.-colonel he was given charge of the surgical division of the 1st London General Hospital (T.F.). He was mentioned in despatches, and was appointed C.B.E. in 1919.

His association with the administration of the University of London began in 1911 when he was elected to the senate, and in 1920 he became dean of the faculty of medicine, and in 1922 vice-chancellor of the university. He had been appointed to the court of examiners of the Royal College of Surgeons in 1911 and to the council in 1913, and from 1932 to 1935 he was president of the college. From 1917 to 1932 he represented the college on the General Medical Council, which he served as treasurer, and he held the same office for the Dental Board from 1921 to 1932.

Much of his work in his own specialty had dealt with the surgery of malignant disease, and the Imperial Cancer Research Fund was another academic body which appointed him its treasurer. When he retired from his office last year he was elected a vice-president of the Fund.

With the years accrued the honours he had earned. In 1925 he was created a knight, and ten years later a baronet. The Royal College of Surgeons of Australasia had elected him to their honorary fellowship, and he had received honorary degrees from the Universities of Durham, Bristol, and Cairo. His varied work and interests had touched life at many points, and his achievements are best described in tributes from friends of different ages and different specialties.

F. R. F. points out that though the close connection of the London medical schools with the university is now accepted as obvious and natural, it was far from being generally accepted between the wars, and Waring worked unceasingly to bring it about.

"As a first step he succeeded in obtaining a charter for St. Bartholomew's Hospital Medical College, so making it administratively independent of its parent hospital, but he had to use all his influence to effect at that time what has now under the National Health Service become a required condition for all the medical schools in London. It was a source of wonder to his friends and colleagues how he managed to reconcile his loyalties to the different bodies in which he held office, but he accomplished this successfully and worked continuously to promote coöperation among the many institutions concerned with medical practice and medical education in London. Only those who were involved with him in obtaining the new ward block for St. Bartholomew's Hospital know how hard he worked in planning it down to the smallest detail, and how carefully he studied the designs of hospitals in this country and abroad before reaching conclusions. If his colleagues, both medical and non-medical, shared with him the responsibility for final decisions, his was the dominant voice on all occasions. Doubtless this dominance was exercised in his other activities and accounts for much of the respect, tinged with fear, that he inspired in his students and in many of his contemporaries. He will not be remembered as a great surgeon or a great teacher, but his methods were successful in forcing essential knowledge into the heads of many students who had difficulty in learning for themselves, and many a story of his explosive language will be told for years to come. His death removes a colourful personality who gave all he had to the welfare of medicine and medical education, and in so doing effected much of lasting value. He will be remembered also by those who knew him best for his courtesy and kindnesses."

Of Sir Holburt's many excellent attributes the one that stands out most vividly in H. W.'s memory, and dwarfs everything else, was his intense interest in his own hospital.

"Where its welfare was concerned, it always came first and nothing else mattered. Not always completely tactful in the way he addressed his views, his persistence and thrust always sufficed to win the day and get what he wanted and thought right. St. Bartholomew's are very grateful for all the great improvements and advantages he secured for them. Sir Holburt was a good judge of men and he possessed the valuable trait of being able to depute work successfully to others. He had a beautiful pair of hands, and in his younger days he was a very neat and efficient operator. When he retired, his invaluable help and the standard of service and behaviour he enforced on other people, and carried out himself, in the hospital, was greatly missed, and always will be."

J. E. remains grateful for having had his basic surgical training from Sir Holburt.

"An exact thinker himself, he insisted on his students carrying out examinations, writing notes, and expressing themselves in a similarly exact manner. Brusque almost to the point of rudeness, the Old Man, as he was affectionately called by all who worked with him, never forgot one of his old students; and many of them have reason to thank him for that personal letter of recommendation which can mean so much in a young man's career."

W. R. T. admits that to all his dressers and to many of his house-surgeons Sir Holburt was an enigma, but suggests that there is no doubt that his brusque manner was something of a pose and partly accounted for by the rough handling he himself received as a young man from Harrison Cripps and others.

"Sir Holburt was one of the last of the surgeons who may be said to have lived through the heyday of consulting practice, the first quarter of this century; on one occasion going even as far as Nepal to operate. He lived and moved in the grand manner, and to see the half-hunter flicked open at just the right moment when examining a private patient was a revelation as to how this should be done. As a judge of wine and cigars he had few equals, and he was most intolerant of dressers satisfied with beer from the White Hart and 'Goldflakes' (then selling at less than a shilling for twenty). 'You young men of the present day who stand about with your hands in your pockets smoking cigarettes . . .' Great was the jubilation throughout the firm when someone spotted the Old Man buying a packet for himself one evening on Liverpool Street Station.

"Until recent years he had substantial colliery interests, and these helped to make him a shrewd man of affairs, with resulting benefits to any institution with which he was connected. Although he liked to get his own way, he usually had sound reasons for wanting to do so.

"His teaching was plain straightforward practical stuff and he expected his dressers under supervision, and most certainly, his residents to be able to tackle any ordinary task a

doctor may be called upon to do. I remember, when a dresser, that the house-surgeon suggested a dental surgeon should be asked to treat a patient then in the ward. This suggestion elicited the characteristic reply 'What is the use of a house-surgeon who can't draw teeth?' Within twenty-four hours that house-surgeon and the dresser learnt quite a lot about dental surgery.

"But it was after he retired, that I really came to know Sir Holburt, for he often came to stay during the time I practised in the West Country. He was unusually well informed about the simple things that interest ordinary folk, and on one occasion when he went to a tennis party with us he was a tremendous success. Yes, he mellowed when old."

Another former student recalls the army-like discipline that was traditional on the Waring firm.

"Clean white jackets, well-polished shoes, sharp scissors, and torches that worked, were expected on parade, when we waited for him near the fountain. He expected from us complete knowledge of our cases and diagnoses as detailed and tabulated as items listed in a Civil Service inventory. 'Hernia, inguinal, right,' you were supposed to say and, by way of encouragement, he would continue in unison with you, 'indirect, epiploenterocele, reducible, recurrent, non-strangulated.' But incorrect answers would call forth his displeasure and often his favourite epithet—'you pink flamingo!'—meaning that you were a perfectly useless creature possessing however slight ornamental value.

"He always stood with a perfectly straight back and he expected others to do the same: the hands were often in the pockets of the white coat. His hair was snowy white and plentiful, and his blue eyes fierce and commanding as he looked at you in a somewhat supercilious and sometimes even a defiant way. His voice, always subdued at the bedside, had a nasal quality, while his address tended to be bullying in tone. But his manner was assertive rather than arrogant and he inspired affection rather than fear, for conscientious work won his respect though not his praise. He never smiled, but he was not unfriendly or unapproachable.

"He was at his fieriest in the theatre, but the roar and thunder of his voice as he moved from the first table to the second disturbed no-one but the novice and the occasional visitor. His bark was always far worse than his bite, and the chief assistant and the theatre sister, for whom he had profound respect, always had the situation well in hand.

"Then there was that great formality of his famous dinner parties for his dressers. I have fleeting memories of the long mahogany table in the beautiful room, a lavish display of crystal glasses, lace and silver, the thrill of the wines, the dinner jackets of one's carefully groomed colleagues, and the affable conversation of our chief. Only then and at the firm's Christmas concert did one see the light of kindliness momentarily break through the stern blue eyes of this essentially shy man."

While Sir Holburt was treasurer, A. D. W. relates, the capital of the Imperial Cancer Research Fund was trebled and its annual expenditure quadrupled.

"The two major developments of the Fund during his time have been largely due to his instigation—the obtaining of a royal charter and the erection of the Fund's own premises and move from Queen Square to Mill Hill. Both were carried through under his close supervision, and the Fund will always be in his debt for the ability and devoted care which he gave not only to these major questions but to all its financial and legal affairs during his long period of office."

In 1900 Sir Holburt Waring married Annie Cassandra, daughter of Mr. C. J. Hill, who died in 1948. Their only child, Mr. A. H. Waring, who succeeds to the baronetcy, is a research engineer with Imperial Chemical Industries.

BERTRAM MITFORD HERON ROGERS

B.A., D.M. Oxfd

Dr. Bertram Rogers, who died at Oxford on Feb. 9, at the age of 92, had passed most of his professional life in Bristol.

His father, J. E. Thorold Rogers, M.P., was professor of political economy at Oxford and at King's College, London. From Westminster School, Rogers entered Exeter College, Oxford, where he gained a blue for association football. He continued his medical studies at University College Hospital, London, and qualified in 1889, taking his D.M. three years later.

On first going to Bristol, he engaged in general practice, but he was soon appointed physician to the Bristol Children's Hospital, and he always took a special interest in children's diseases. He played an active part in the public and professional life of the city. For some years he was secretary of the Bristol Medico-Chirurgical Society's journal, and in 1910 he was elected president of the society. As the subject of his presidential address he chose Medical Aspects of Boswell's *Life of Johnson*. Another paper based on his wide reading was his article in the *Times* in 1937, describing his discovery of two unpublished letters of Lewis Carroll. He was chairman of the Bristol branch of the St. John Ambulance Association, and treasurer of the local Royal Empire Society branch. During the 1914–18 war he commanded a field ambulance. He was highly esteemed by his colleagues; but few if any of them are living still, to mourn his loss.

WALTER HENRY GRACE

B.Sc. Sydney, M.D. Lond., F.R.C.P.

Dr. Grace, lecturer in forensic medicine and toxicology in the University of Liverpool, and forensic pathologist for the Home Office in the north-west region, died on Feb. 10 at his home near Chester.

Born in Australia in 1892, he took his B.SC. with first-class honours in the University of Sydney. Soon afterwards he came to England, where he continued his medical education at Guy's Hospital, graduating M.B. in 1918, and proceeding to the M.D. in 1922. He held several house-appointments at Guy's before he became senior assistant bacteriologist to the hospital.

A few years later he was appointed pathologist to Chester Royal Infirmary, and he quickly won for himself an authoritative position as a medicolegal consultant in North Wales, Liverpool, and the West Midlands. He became a member of Middle Temple in 1938, and in the same year was appointed to his lectureship at Liverpool University. In 1939 he was elected F.R.C.P. For some years he was an examiner for the universities of London, Glasgow, and Leeds.

In 1947 he was appointed to his Home Office post, and he figured prominently in many murder investigations and trials in the North of England, including the "Hanging Boy" case, the Cameo, Neston, and Red Wharf Bay murders, and those associated with the names of Dr. Ruxton and Dr. Clements. About a year ago increasing physical limitations led him to retire from active medicolegal practice.

"The essence of Grace's nature," writes J. M. L., "was gentleness, kindness, charm, and an unfailing courtesy. His quiet, genial manner appealed alike to colleagues, students, and laymen. His wide sympathies, combined with a delightful sense of humour, endeared him to all with whom he came into contact. He was popular with his students, who will long remember his flashes of wit and apposite commentaries on current events and problems. He was an interested observer of the academic comedy, and he enjoyed the arguments at meetings of the faculty of medicine and found a certain relish in the business of committees."

In his picture of Dr. Grace, K. S. recalls "a leonine head of near-white hair and a slow deliberation of manner which gave him a presence which seemed far older than he was—but provided a deceptive veneer to a mind that grasped the essentials of a forensic problem, foresaw the trend of cross-examination, and could adhere with a calm unshakable determination to a view he had decided was proper. These are the fundamental assets of a good witness—for both prosecution and defence; and Grace acquired the respect of each, making many friends on the Bench and at the Bar.

"He was no iconoclast, and often sought out his colleagues to sound his opinion before committing himself in court. The Euston Hotel was his choice of milieu for such meetings—with Spilsbury, Eric Gardner, Keith Simpson, or maybe an old Guy's colleague whose special experience he wished to probe, and the hotel staff plainly allowed him much latitude in these friendly consultations, which might last far into the night. Grace presented his facts lucidly and with a nice sense of humour, showed himself a good raconteur—but never failed to listen, to test theory by his academic knowledge and experience, and to express his gratitude with a courtesy that, if it sounded a little portentous, was none the less genuine. He worked hard and relaxed little, found it impossible to detach himself sufficiently to write, and may not therefore figure greatly in the history of medical jurisprudence. He

applied his talents with great patience to each new problem, showed an impartiality which won him the regard of police and the law, and never failed to give sound advice of a conservative kind. He appeared in many famous trials and he survived a public esteem with the same charming 'grand old man' detachment as he surveyed the Bench and Bar. Many will miss this warm-hearted man and will regret that he was denied the pleasures of relaxation in retirement. He would not have lacked visitors and invitations, intellectual and more rustic diversions, conversation, and a ripe enjoyment of later years. His life had been full, he had enjoyed it enormously, and it needed only a chapter of happy retirement to complete it."

Dr. Grace is survived by his wife and two sons, one of whom took his M.B. at Liverpool in 1950 and is now serving in the Navy. His brother, Dr. A. W. Grace, is professor of clinical dermatology at Long Island University, New York.

GORDON CAMPBELL KINLOCH REID

M.B. St. And., L.D.S.

Dr. Reid, pathologist of the Walsall group of hospitals, died at his home in Walsall on Feb. 6, at the age of 49.

He was born at Elgin, but he spent his boyhood at Perth, where he attended the Perth Academy. From there he proceeded to St. Andrews University. In 1929 he took the L.D.S. and graduated M.B. He held a number of hospital posts and spent some time in general practice before he became resident surgical officer to New Cross Hospital, Wolverhampton, in 1935. Through the laboratory service of the hospital he was brought into contact with the practice of clinical pathology, which made an immediate appeal to him, and in 1938 he joined the staff of The Royal Hospital, Wolverhampton, in the joint capacity of resident medical officer and assistant pathologist.

Dr. Reid devoted immense energy to the development of the Wolverhampton and district blood-transfusion service, then based upon the pathological department of The Royal Hospital. It was largely owing to his efforts in its early days that this service was able to bear all calls upon it at the beginning of the late war before it was merged into the Emergency Blood Transfusion Service. In 1940 he joined the R.A.M.C., and as a specialist in pathology with the rank of major served with distinction in the Eighth Army, both in North Africa and on the Continent. Under the pseudonym of "Pixie" he was widely known throughout the medical service of the Eighth Army. After D-day he was mentioned in despatches for conspicuous gallantry and devotion to duty.

After demobilisation, for a short time he again served in the pathological department of The Royal Hospital, Wolverhampton. In 1946 he became attached to the Walsall General Hospital, first as assistant and later as full pathologist, and under the National Health Service he became consultant pathologist to the Walsall hospital group. In this post he unstintingly applied his immense energy, and in a short time had brought the pathological service centring upon these two hospitals to a high state of efficiency. Since 1951 his work had been interrupted by his serious and disabling illness, but with great fortitude he returned to his post in the spring of 1952 and continued to fulfil its duties until December.

S. C. D. writes: "Dr. Reid was a great clinical pathologist, exactly of that type of which the national hospital service stands most in need. He read widely and kept himself well abreast of current knowledge in all branches of his subject. But the secret of his success as a clinical pathologist, and the reason for the universal regard and affection which he came to command, was that to him the welfare of the patient, whether in or out of hospital, was a major concern. His years of clinical experience, both in general practice and in hospital posts, stood him in admirable stead in bringing the work of the laboratory and of the wards into intimate and fruitful contact. His laboratory was freely open to all general practitioners of his neighbourhood, and in it both they and their patients were always sure of a ready welcome and a sympathetic and kindly hearing."

Dr. Reid married Miss Dorothy Pollitt, S.R.N., in 1946; she survives him with two children.

RANSOM PICKARD

C.B., C.M.G., M.D., M.S. Lond., F.R.C.S., D.P.H.

Colonel Ransom Pickard, who died on Feb. 9, at the age of 85, was well known in the West Country as an ophthalmologist, and he was also one of Exeter's most distinguished citizens.

He graduated M.B. with first-class honours from St. Bartholomew's Hospital in 1889, and after holding house-appointments there and at Moorfields he took higher qualifications in his specialty before he settled down in Exeter in the '90s. After a few years in general practice he was appointed surgeon to the West of England Eye Infirmary. No man ever took his hospital duties more seriously, or took more trouble over his patients, and as a hard worker himself he expected a high standard from others. It was not surprising that he soon built up a large private practice, and such was his reputation that he retained an unusually large measure of it after his retirement from his hospital post in 1932.

In the 1914–18 war Pickard was mobilised as lieut.-colonel in command of the 1st Wessex Field Ambulance, which he had been instrumental in raising, and he saw immediate service in France. He was later promoted A.D.M.S. of the 48th Division with the rank of colonel, and he served in North Italy with this division until demobilisation. Five times mentioned in despatches, he was awarded the Italian croce della guerra and was appointed C.B. and C.M.G.

Pickard contributed fairly often to the medical journals; and he was particularly interested in glaucoma and in cases of low tension with disc cup enlargements. He took immense pains over the papers which he wrote, and he would often turn up at the Eye Infirmary at 8 A.M. to take a tonometer reading. He was also regular in his attendance at medical meetings and he seldom failed to contribute to the discussion something that was worth hearing. He never talked nonsense and he never failed to command the respect of his colleagues. Perhaps it was for that reason that he was chosen for the unenviable position of chairman of the local committee which in the 1939–45 war had to decide which doctors should serve in the Forces and which should remain behind.

But Pickard was a citizen as well as a doctor, and for several years, until 1947, he achieved the distinction, unique for a former member of the surgical staff, of being president of the West of England Eye Infirmary. He had already served Exeter as sheriff (1906–07), and as mayor (1927–28), and he had a long association with the University College of the South-West, of which he became a vice-president. He was also a vice-president of the Exeter Drama League; and a past president of the Devonshire Association, and of the Devon Archæological Exploration Society.

M. D. B. writes: "One of Pickard's chief delights was walking. Almost every Saturday of his life, dressed for the part, he went for a long walk in the country. He really loved these walks (and the planning of them) and the Devon country: they were a part of his life, and nothing—least of all bad weather—deterred him from taking them. He never had a car, he always walked everywhere, and he never seemed to feel the cold. I can only remember seeing him in an overcoat once or twice—a rather inadequate garment disliked and despised by its owner, who thought almost as poorly of a mackintosh. In earlier years he was a keen mountaineer, and a member both of the Alpine Club and of the Swiss Alpine Club.

"Pickard did not marry till he was 45, but he had forty years of extremely happy married life. Mrs. Pickard shared many of his interests and was the ideal wife for a personality which in his younger days was perhaps a little rugged, and which she succeeded in mellowing into the fine old man that Exonians remember so well.

"He had always been a non-smoker and a teetotaller, and, last but not least, he was a life-long Methodist. Every Sunday,

morning and evening, he attended church in Exeter, and, though he never discussed his religion there is no doubt that it meant everything to him, and guided the whole conduct of his life."

JAMES ARTHUR KERR

V.R.D., M.D., B.Sc. Glasg., D.P.H.

WE have to record the death of Dr. J. A. Kerr, medical officer of health for the county borough and port of Grimsby, on Feb. 10, at the age of 54.

Born in Glasgow, he was educated at the High School and University of his native city. His undergraduate career was interrupted by service as a surgeon probationer in the Navy during the first world war, but he qualified in 1923. He took his D.P.H. two years later, and while working for this studied law and became a member of the Middle Temple. His M.D. was obtained with commendation in 1928. He held resident posts in the Western Infirmary, Glasgow, and became successively senior assistant medical officer at Manchester City Fever Hospital, deputy medical officer of health for Chester, and senior assistant medical officer of health for Birmingham.

His services to Grimsby, where he was appointed M.O.H. in 1934, were of a high order, for they were based alike on ability, energy, courage, and sympathy. Characteristically, he was fully engaged in public duties until the evening before his brief terminal illness. For twenty years he had been handicapped by severe physical disability, but he had remained an unusually dynamic figure, always a leader in planning improvements in the town's medical facilities and always ready to help his colleagues either in their day-to-day difficulties or in any cause which he felt justified his support. He was fearless in expressing his views, and he put them forward with a vigour which made him a valuable and much respected member of any committee.

In the second world war he again served in the Navy and he was awarded the King Haakon VII Liberation Medal for outstanding services in connection with the liberation of Norway. He remained a surgeon commander, R.N.V.R.

Among his local appointments, Dr. Kerr was the school medical officer and was consultant in infectious diseases at Springfield Isolation Hospital. He was a member of the Grimsby Hospitals Management Committee, the local medical and local obstetric committees, and the local executive council. His broad and accurate knowledge and his good will enabled him to maintain excellent relations between his department and his colleagues in general practice. His handling of the poliomyelitis epidemics in 1938 and 1947 and the smallpox epidemic in 1947 earned high praise from those who worked with him. Largely owing to his foresight and enthusiasm, an almoner service was established in the health department in 1949, and the mental health services were founded and steadily improved. It was with Dr. Kerr's coöperation that Dr. J. W. Brown established his well-known clinics for heart-disease and rheumatism. He was also a very active member of the Lincolnshire Joint Cancer Committee, whose pioneer scheme made specialist treatment available to many who otherwise would not have had it. His professional interests extended outside Grimsby and he was president of the East Midland branch of the Society of Medical Officers of Health for 1949–50, and an examiner to the Royal Sanitary Institute. He was also a member of the general and medical committees of the Association of Sea and Air Port Health Authorities of the British Isles. His published work includes articles on puerperal sepsis and its cardiac and pulmonary complications, on fish inspection, and on the treatment of poliomyelitis.

To the end of his life, he found time for numerous activities outside medicine. In Grimsby he was president of the Royal Naval Association, president of the Grimsby and Cleethorpes Rotary Club, and chairman of the international service committee of Rotary. He was chairman of the civilian committee of the Sea Cadet Corps, and president of the Hard of Hearing Association, which he helped to found.

In 1933, he married Doreen, daughter of the late Dr. A. M. Nevin of Birmingham, and she survives him with two sons and a daughter.

Notes and News

PRESCRIPTION COSTS

PRESENTING the civil appropriation accounts,[1] the Comptroller and Auditor-General remarks that in 1950 18% of all prescriptions under the National Health Service in England and Wales, and 26% of those in Scotland, were for proprietary preparations. In England and Wales the 18% accounted for 33·5% of the total cost of prescriptions. In 1951 the percentage of prescriptions for proprietary preparations increased to 23 in England and Wales and to 30 in Scotland; and in April, 1952, a sample analysis of prescriptions in England and Wales showed a further rise to 25·6%.

SCHOLARSHIPS ABROAD

THE British Council has published a booklet giving details of about 100 scholarships offered by 17 foreign governments and universities to British students for study abroad during 1953–54. Further information may be had from the controller of the education division of the council, 65, Davies Street, London, W.1.

University of Cambridge

On Feb. 6 the following degrees were conferred:

M.D.—I. S. Hodgson-Jones.

M.B., B.Chir.—* I. M. Brown.

* By proxy.

Royal College of Surgeons of England

At a meeting of the council on Feb. 12, with Sir Cecil Wakeley, the president, in the chair, Mr. Geoffrey Keynes was presented with the Cecil Joll prize.

Prof. Ian Aird (Postgraduate Medical School) and Mr. F. W. Holdsworth (Sheffield) were re-elected and Mr. E. S. Lee (Westminster Hospital) was appointed to the court of examiners for the next three years. Mr. A. H. Lendon (Adelaide) and Prof. H. R. Dew (Sydney), the present Commonwealth travelling professor, were elected members for one year.

A Hunterian lectureship was awarded to Prof. Wilder Penfield, O.M. (Montreal), and a Moynihan lectureship to Dr. H. L. Jaffe (New York). The Hallett prize was awarded to A. T. Matheson (Cape Town), and the Handcock prize to A. H. Tooley (King's College Hospital).

Diplomas of membership and postgraduate diplomas were granted to those named in our report (Feb. 7, p. 303) of the comitia of the Royal College of Physicians.

Hunterian Festival Dinner.—At this dinner on Feb. 13 Sir Cecil Wakeley, the president, said that the Queen had graciously consented to lay the memorial stone of the new buildings on May 5. He was also happy to announce that the Duke of Edinburgh had promised to come to the college to receive the honorary fellowship in the autumn. Good progress was being made with the new college: the framework and floors of the Great Hall and the dining-room of the Nuffield College of Surgical Sciences were complete; and the Wellcome museums, the new council room, and the library extension were beginning to take shape. There were hopes of making a start on the main block of the Nuffield College later this year. Sir Cecil said that this was probably the last Hunterian dinner to be held in the present library, for the Great Hall should be ready in good time for the festival of February, 1955. A great deal of research work was in hand at the college, and the president referred particularly to the plans of the department of pharmacology which were being generously supported by certain pharmaceutical firms. Sir Cecil was replying to the toast of The College, proposed by the Minister of Health, Mr. Iain Macleod. Sir James Paterson Ross extended a friendly welcome to the large company of guests, for whom Sir Denys Lowson replied. Sir Reginald Watson-Jones, proposing the toast of The Hunterian Orator, said how magnificently Mr. Lionel Norbury had paid homage to the memory of John Hunter in his oration earlier in the day. Mr. Norbury, in a brief reply, spoke of the pleasure and satisfaction to be derived from a study of the history of medicine; his own researches into the Hunterian era had proved an absorbing source of interest.

1. Civil Appropriation Accounts (classes I–VIII), 1951–52. H.M. Stationery Office. Pp. 487. 14s.

University of Liverpool

The following have been successful in the examination for the diploma in tropical medicine and hygiene:

K. M. Aboud, A. N. Basu, S. N. Bhattacharya, K. R. I. Hariharan, *R. Hecker, E. S. Jones, G. Moles, Y. Na Songkhla, H. C. C. Nwankwo, T. Viriyakul.

*Milne medal in tropical medicine and Warrington Yorke medal in tropical hygiene.

Queen's University, Belfast

At recent examinations the following were successful:

M.B., B.Ch., B.A.O.—D. J. Acheson, Barbara D. Allen, G. A. Balmer, Ann T. Bowden, G. W. Donaldson, T. N. Elwood, Andrew Gaston, Mary S. Gilbody, K. I. McD. Heath, Sheila H. Hoey, A. K. Irvine, R. H. Johnson, James Kelly, G. W. C. McCartney, J. D. McDowell, A. C. M. L. Miller, H. R. St. L. Ormonde, G. B. Purce, Ellen D. Shilliday, A. B. Siewers, F. A. Thompson.

University of Edinburgh

Dr. Pierre Mallet-Guy of the department of surgery, University of Lyons, will deliver a lecture on Monday, March 9, at 5 P.M. at the University New Building. He will speak on the Manometric and Radiographic Control of Biliary Surgery.

Royal College of Physicians of Ireland

On Feb. 6 the following were admitted to the membership of the college:

G. T. L. Archer, V. T. B. Doyle, T. M. Gregg, Elinor D. U. Powell.

Betterment for Consultants

At a recent meeting of the South-West Metropolitan (Western Area) Regional Consultants' and Specialists' Committee, the following resolution was passed:

"The South-West Metropolitan (Western Area) Regional Consultants' and Specialists' Committee urges the Joint Committee to press for full and retrospective implementation of the Spens Report as regards salaries of Hospital Medical Staff, and only to accept a betterment factor which is comparable to that recently decided by arbitration as applicable to general practitioner remuneration."

University of Wales

Sir Cecil Wakeley, F.R.C.S., will deliver the fourth William Sheen lecture on Wednesday, March 25, at 8 P.M., at the Reardon Smith lecture-theatre, Park Place, Cardiff. He is to speak on Modern Trends in the Treatment of Cancer.

Summer School in Health Education

The Central Council for Health Education is holding its summer school this year at Royal Holloway College, Englefield Green, Surrey, from Aug. 10 to 20. Further particulars can be had from the medical director of the council, Tavistock House, Tavistock Square, London, W.C.1.

Social Policy and the Social Sciences

The British Sociological Association is holding a conference on this subject during the weekend March 27–29 at Queen Elizabeth College (formerly King's College of Household and Social Science), Campden Hill Road, London, W.8. The opening address on the Relation between Social Theory and Social Policy will be given by Mr. Gunnar Myrdal, executive secretary of the Economic Commission for Europe. Papers will be presented for discussion on Health; Design and Planning—Buildings, Town, and Countryside; and Needs and Standards in the Social Services. The contributors to the section on health will include: Prof. T. Ferguson Rodger, Dr. J. N. Morris, Dr. Milton Roemer, Mr. A. T. Chester, Dr. J. H. F. Brotherston, and Prof. R. M. Titmuss. The conference will be open to non-members, and particulars may be had from the secretary of the association, Skepper House, 13, Endsleigh Street, W.C.1.

EMERGENCY BED SERVICE.—In the week ended last Monday applications for general acute cases numbered 1730. The proportion admitted was 77·93%. A yellow warning is still in force.

Chesterfield Medal in Dermatology.—The examination for this award will be held on March 9, 10, 18, and 19. Applications should be sent by Feb. 28 to the secretary of the Institute of Dermatology, St. John's Hospital for Diseases of the Skin, Lisle Street, London, W.C.2.

Diary of the Week

FEB. 22 TO 28

Monday, 23rd

UNIVERSITY COLLEGE, Gower Street, W.C.1
4.45 P.M. Prof. Jean Roche (Paris): Comparative Biochemistry of Iodoproteins.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, S.E.5
5.30 P.M. Dr. E. Stengel: Lecture-demonstration.

HUNTERIAN SOCIETY
8.30 P.M. (Mansion House, E.C.4.) Mr. A. Dickson Wright: Quacks of John Hunter's Time. (Hunterian oration.)

MANCHESTER MEDICAL SOCIETY
5 P.M. (University of Manchester.) *Section of Odontology.* Mr. R. J. V. Battle: Management of Harelip and Cleft Palate.
9 P.M. *Section of General Practice.* Dr. James Kerr: Legal Problems in General Practice.

Tuesday, 24th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. James Moroney: Colonic Replacement and Restoration of Human Stomach. (Hunterian lecture.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. P. L. Mollison: Life-span of Red Cells.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Section of Medicine.* Prof. D. M. Dunlop, Dr. S. Leonard Simpson, Dr. E. N. Allott: Addison's Disease.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. L. Forman: Skin Diseases Related to Cancer.

WEST END HOSPITAL FOR NERVOUS DISEASES, 40, Marylebone Lane, W.1
5.30 P.M. Dr. Colin Edwards: Neurological demonstration.

CHADWICK LECTURE
2.30 P.M. (26, Portland Place, W.1.) Dr. Georges Decharneux (Liége): Industrial Medicine and Hygiene in Belgium.

Wednesday, 25th

ROYAL SOCIETY OF MEDICINE
10 A.M. *Section of Endocrinology.* Symposium on the Thyroid Gland.

ROYAL EYE HOSPITAL CLINICAL SOCIETY, St. George's Circus, Southwark, S.E.1
6 P.M. Miss J. M. Dollar, Miss M. Savory: Exenteration of the Orbit. (Film.)

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. A. Dudgeon: Virus Diseases.

INSTITUTE OF UROLOGY, St. Paul's Hospital, Endell Street, W.C.2
5 P.M. Mr. J. Sandrey: Vesical Neoplasms.

BIRMINGHAM MEDICAL INSTITUTE, 154, Great Charles Street, Birmingham, 3
8 P.M. *Section of Psychiatry.* Mr. Malcolm Piercy, B.A.: Leucotomy of Autonomic Nervous System.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. *Section of Medicine.* Dr. C. M. Fletcher: Research into Occupational Dust Disease.

YORKSHIRE SOCIETY OF ANÆSTHETISTS
8 P.M. (Leeds General Infirmary, Leeds, 2.) Dr. G. E. Hale Enderby: Reduction of Surgical Hæmorrhage by Controlled Hypotension.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow, C.2
5 P.M. Dr. Alastair G. Macgregor: Thyrotoxicosis—Diagnosis and Treatment by Modern Techniques. (James Watson lecture.)

Thursday, 26th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. L. P. LeQuesne: Management of Water and Electrolyte Administration during Postoperative Period. (Arris and Gale lecture.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Dr. A. H. T. Robb-Smith: Functional Significance of Connective Tissue.

UNIVERSITY COLLEGE
4.45 P.M. Prof. V. B. Wigglesworth, F.R.S.: Chemical Aspects of Insect Physiology. (Second of four lectures.)

ROYAL SOCIETY OF MEDICINE
8 P.M. *Section of Urology.* Dr. G. I. M. Swyer, Mr. W. Selby Tulloch: Male Infertility.

INSTITUTE OF CHILD HEALTH, The Hospital for Sick Children, Great Ormond Street, W.C.1
5 P.M. Dr. G. Stewart Prince: Emotional Problems of Puberty.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Sir Clement Price-Thomas: Carcinoma of the Lung.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, S.W.1
5 P.M. Dr. M. A. Partridge: Psychiatry demonstration.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
4.30 P.M. Sir Russell Brain, P.R.C.P.: Neurology of Cervical Spine.

UNIVERSITY OF ST. ANDREWS
5 P.M. (Medical School, Small's Wynd, Dundee.) Prof. G. A. H. Buttle: Chloramphenicol, Aureomycin, and Terramycin and Resistance Developed to Them.

Friday, 27th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Section of Pædiatrics.* Dr. D. W. Winnicott: Symptom Tolerance in Pædiatrics. (Presidential address.)
8.15 P.M. *Section of Obstetrics and Gynæcology.* Dr. R. H. J. Hamlin, Mr. H. M. Carey, and Mr. N. F. Morris: Pregnancy Toxæmia.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. D. I. Williams: Alopecia.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.1
7.30 P.M. Dr. Denys Ford: Chronic and Recurrent Arthritis of Genital Origin.

Saturday, 28th

UNIVERSITY OF CAMBRIDGE
10.30 A.M. (Addenbrooke's Hospital.) Symposium on Dermatology. (Postgraduate course for general practitioners.)

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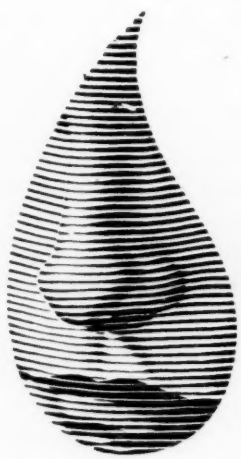

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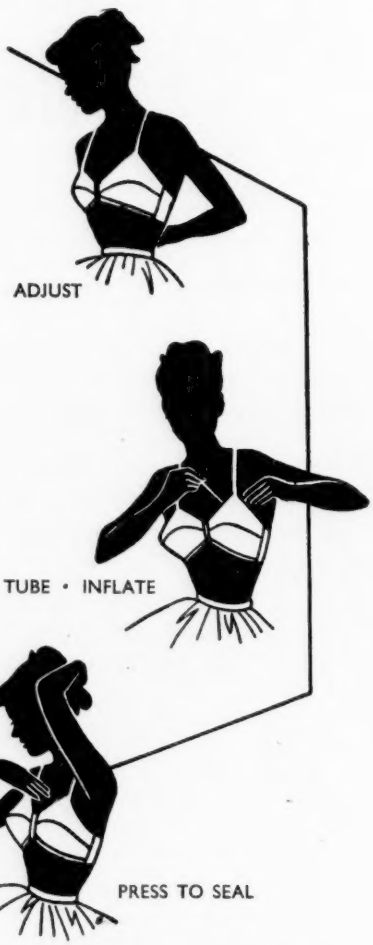

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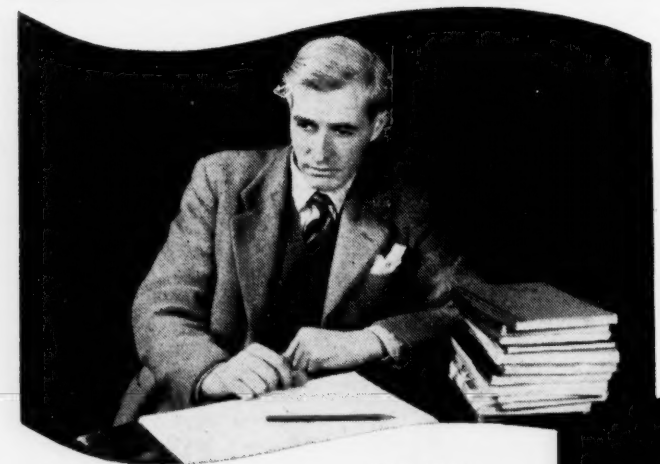

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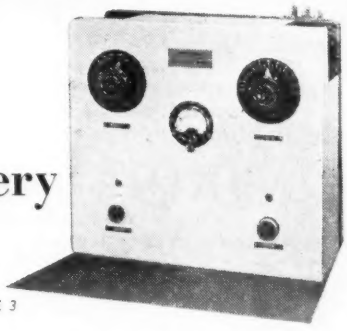

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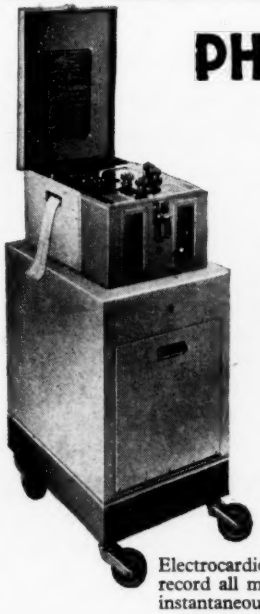

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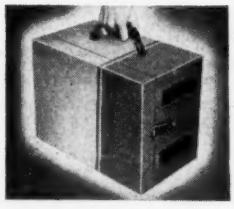

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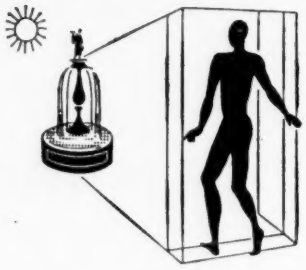

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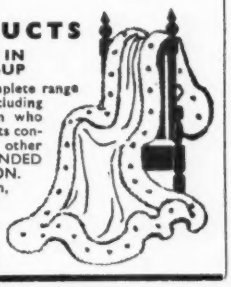

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

UNIVERSITY OF LONDON

BRITISH POSTGRADUATE MEDICAL FEDERATION
THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY
330/332, Gray's Inn-road, London, W.C.1

AN INTENSIVE COURSE IN ENDOSCOPY for senior students and practising members of the specialty will be given from 13TH to 18TH APRIL, 1953.

The course will be a whole-time one and will include practical work. Fee £10 10s.

Detailed syllabus obtainable from the Dean.

UNIVERSITY OF LONDON

GRANTS FOR RESEARCH

Applications are invited from members* of the University for grants from the Central Research Fund to assist specific projects of research and for the provision of special materials and apparatus. Grants are not made for normal maintenance.

Applications must next be received not later than 31ST MARCH, 1953. Forms of application and further particulars may be obtained from the Secretary to the Central Research Funds Committee, University of London, Senate House, London, W.C.1.

*Members of the University are defined by Statute as the Chancellor, the members for the time being of the Court and of the Senate respectively, the Professors and Readers and other Teachers of the University during their tenure of office, the graduates and the Students.

UNIVERSITY OF ST. ANDREWS

DIPLOMA IN PUBLIC HEALTH
DIPLOMA IN PUBLIC DENTISTRY

Courses of instruction for the Diplomas in Public Health and Public Dentistry will be given in the University during the Academic Year 1953–54, extending from OCTOBER, 1953, to JUNE, 1954.

Full particulars as to the courses, fees, &c., may be obtained either from the Secretary of the University or the Dean of the Faculty of Medicine, but application for admission should be made to the Dean of the Faculty of Medicine, Medical School, Dundee. DAVID J. B. RITCHIE, Secretary.

The University, St. Andrews, 13th February, 1953.

UNIVERSITY OF GLASGOW

POSTGRADUATE MEDICAL EDUCATION COMMITTEE

REFRESHER COURSE FOR GENERAL PRACTITIONERS

A Refresher Course of 1 fortnights duration designed for General Practitioners will be held from 18TH MAY to 30TH MAY, 1953. The greater part of the Course will comprise clinical demonstrations, ward visits, and lectures in general medicine, general surgery, and obstetrics, but sessions on infectious diseases, child health, ophthalmology, dermatology, and rehabilitation of the aged will also be included.

The fee for practitioners not claiming expenses from Government sources is 10 guineas.

Since the number admitted to the Course is limited, early application should be made to the Director of Postgraduate Medical Education, The University, Glasgow, W.2, from whom the syllabus and further information may be obtained.

THE MIDDLESEX HOSPITAL MEDICAL SCHOOL, W.1

PRIZE IN APPLIED PHARMACOLOGY

An annual prize, value 25 guineas, has been instituted, and the Examination will consist of a 3-hour Paper and a Viva.

Candidates must be ex-students of the School who have obtained their first registrable medical qualification at least 3 months and not more than 15 months before 30th April, 1953.

The Paper will be written at The Middlesex Hospital Medical School on 11TH MAY, 1953.

Candidates are required to submit their names in writing to the Dean not later than Thursday, 30th April, 1953.

INSTITUTE OF UROLOGY

in association with
ST. PETER'S, ST. PAUL'S, AND ST. PHILIP'S HOSPITALS

WEEKEND COURSE ON "THE ESSENTIALS OF UROLOGY"
6TH–8TH MARCH, 1953

Friday, 6th March, St. Peter's Hospital

Time	*Title*	*Lecturer*
2 P.M.	Operating Session, Prostatectomy and Cystoscopy	Mr. HARLAND REES

Friday, 6th March, St. Paul's Hospital

8–9 P.M.	Lecture: Hæmaturia	Mr. J. D. FERGUSSON

Saturday, 7th March, Hillingdon Hospital

10 A.M.–12 NOON	Demonstration on "Clinical Cases"	Mr. H. G. HANLEY

Lunch at Hillingdon Hospital

Saturday, 7th March, St. Paul's Hospital

2–3 P.M.	Lecture: Hydronephrosis	Mr. D. M. WALLACE
3.30 P.M.–4.30 P.M.	Lecture: Calculous Disease	Dr. C. E. DUKES

Tea

Sunday, 8th March, St. Paul's Hospital

10 A.M.–11 A.M.	Lecture: Injuries of the Urinary Tract	Mr. D. I. WILLIAMS
11.30 A.M.–12.30 P.M.	Lecture: Urinary Infections	Mr. F. R. KILPATRICK

Lunch at St. Philip's Hospital

Sunday, 8th March, St. Paul's Hospital

2–4 P.M.	Demonstration on "X-ray Diagnosis"	Dr. J. J. STEVENSON

Fee for the course 5 guineas. Lunch and tea will be provided.

Applications to the Secretary, Institute of Urology, 10, Henrietta-street, Covent Garden, W.C.2.

INSTITUTE OF BASIC MEDICAL SCIENCES

LECTURES AND DEMONSTRATIONS IN ANATOMY, APPLIED PHYSIOLOGY AND PATHOLOGY, OCTOBER, 1953–JANUARY, 1954

A full-time Course of Lectures and Demonstrations in the above subjects will be held at the Institute from 5th October, 1953, to 1st January, 1954. Applications for this Course will be strictly limited. Fee £63.

Closing date for applications is Thursday, 2nd April, 1953.

LECTURES IN ANATOMY, APPLIED PHYSIOLOGY AND PATHOLOGY. OCTOBER, 1953–JANUARY, 1954

A course of Lectures only in the above subjects will be held at the Institute from 5th October, 1953, to 1st January, 1954. The Lectures will be held in the mornings from MONDAY to FRIDAY each week. Fee £36 15s.

Full information and application forms for these courses may be obtained from Mr. W. F. DAVIS, Secretary, Institute of Basic Medical Sciences, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2. (HOLborn 3474.)

THE WELSH NATIONAL SCHOOL OF MEDICINE

(UNIVERSITY OF WALES)

WILLIAM SHEEN MEMORIAL LECTURE

The Fourth William Sheen Memorial Lecture will be given by Sir CECIL WAKELEY, BT., K.B.E., C.B., LL.D., D.SC., M.CH., F.R.C.S., F.R.A.C.S., F.A.C.S., F.R.S.E., President of the Royal College of Surgeons of England, on WEDNESDAY, 25TH MARCH, 1953, at 8 P.M., in the Reardon Smith Lecture Theatre, Park-place, Cardiff.

The Lecture is entitled:

MODERN TRENDS IN THE TREATMENT OF CANCER.

All medical practitioners and present and past students of the Medical School are cordially invited.

TANCRED'S STUDENTSHIPS

DIVINITY: MEDICINE: LAW

£100 p.a. each. For Men only.

About Whitsuntide next the Governors propose to elect 1 Student in Law at Lincoln's Inn.

Candidates must have been born in England, Scotland, or Wales and be members of the Church of England and unmarried. Candidates must be within the ages of 20 years and 23 years and must have passed an approved examination of School Certificate or General Certificate of Education standard. The last day for sending in Petitions is 10th March, 1953.

A Divinity Studentship will be awarded on the result of an Examination conducted in December, 1953, by the Queen's, Christ's, St. John's, Emmanuel and Sidney Sussex Group of Colleges in the University of Cambridge.

A Physic Studentship will be awarded on the result of the Scholarship Examination conducted in January, 1954, by Gonville and Caius College in the University of Cambridge.

Further announcements relating to the Divinity and Physic Studentships will appear in this paper in April and September.

Apply for further particulars and form of Petition stating kind of Studentship and mentioning this paper to the Clerk, R. M. C. HOWARD, Esq., D.S.O., 28, Lincoln's Inn-fields, London, W.C.2.

FACULTY OF RADIOLOGISTS

D.M.R.D. AND D.M.R.T. (R.C.P. LOND., R.C.S. ENG.)

The next courses in London for candidates for the D.M.R.D. or D.M.R.T. (R.C.P. Lond., R.C.S. Eng.), organised by the Faculty in coöperation with Medical Schools and Hospitals of the University of London, Metropolitan Regional Hospitals, and the British Postgraduate Medical Federation, will commence in OCTOBER, 1953. The courses are normally full-time (fee 85 guineas), but in certain circumstances part-time courses can be arranged.

Application forms and further particulars may be obtained from the Assistant Director, British Postgraduate Medical Federation, 2, Gordon-square, London, W.C.1, to whom all inquiries should be addressed. The closing date for applications from overseas is 31st May, 1953.

THE ROYAL SOCIETY

GOVERNMENT GRANT FOR SCIENTIFIC INVESTIGATIONS

Applications for grants from the first allotment of the Government Grant for Scientific Investigations for the year 1953 should be made as soon as possible on forms of application to be obtained from the Assistant Secretary of the Royal Society, Burlington House, London, W.1. No application can be considered which is received later than 31st March, 1953.

Applicants must be of British nationality, resident in Great Britain or Northern Ireland. Grants may be made for purposes in connection with the promotion and support of research in pure science other than for personal maintenance or payment of stipends; for the assistance of scientific expeditions and collections; but not in aid of scientific publications.

ROYAL COLLEGE OF PHYSICIANS. Applications are invited for a SCHOLAR to work on the problem of the causes of the late mortality in tuberculosis in adult males. The appointment will be for 1 year in the first instance, with a salary in the region of £1000.

Application forms may be obtained from the Assistant Secretary, The Royal College of Physicians, Pall Mall East, London, S.W.1, by whom applications, accompanied by 2 testimonials, must be received not later than Friday, 10th April, 1953.

ROYAL FREE HOSPITAL SCHOOL OF MEDICINE (University of London), Hunter-street, W.C.1. Applications are invited from Men and Women holding Degrees in Medicine or Pharmacology for the post of ASSISTANT LECTURER IN PHARMACOLOGY from 1st October, 1953, at an initial salary of not less than £600 p.a., rising by annual increments of £50 to £750 p.a., with superannuation benefits and family allowances.

Further particulars may be obtained from the Warden and Secretary, to whom applications should be sent not later than 21st March.

GUY'S HOSPITAL MEDICAL SCHOOL, University of LONDON. Applications are invited for the post of DENTAL RESEARCH FELLOW. Appointment will be for 3 years in the first instance. Salary not less than £750 p.a., plus superannuation and family allowance. Candidates should have experience of research in a relevant branch of science. Duties to commence 1st October, 1953.

Forms of application are obtainable from the Dean, Guy's Hospital Medical School, London, S.E.1, to whom applications, with the names and addresses of 2 referees, should be sent not later than Saturday, 28th March, 1953.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL, London, S.E.1. ELIZABETH SAINSBURY RESEARCH FELLOWSHIP in Disease of Children. Applications are invited for the post. Salary £700 p.a. Appointment yearly and eligible for re-election. Adequate clinical and laboratory facilities available.

Applications (3 copies), with usual records and references, to Dean's Office, St. Thomas's Hospital Medical School, S.E.1, by 31st March, 1953.

UNIVERSITY OF OXFORD. Radcliffe Infirmary, Oxford. Applications are invited for the post of NUFFIELD GRADUATE ASSISTANT IN PATHOLOGY. The successful applicant will have opportunities for special training or research in the various aspects of clinical pathology. Previous experience in pathology, although desirable, is not essential. The salary will be on a range from £600 to £1300 according to qualifications and experience.

Applications, together with the names of 3 referees, should be submitted to Dr. A. H. T. ROBB-SMITH, Department of Pathology, Radcliffe Infirmary, Oxford, not later than Saturday, 7th March, 1953.

UNIVERSITY OF GLASGOW. Applications are invited for a LECTURESHIP IN PSYCHOLOGICAL MEDICINE. The successful applicant will act as Assistant to the Professor of Psychological Medicine and will have clinical duties. Salary according to placement on University scale for clinical teachers. The final maximum is £1500 p.a.

Applications (16 copies), should be lodged, not later than 14th March, 1953, with the undersigned from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

Hospital Services : Senior Appointments

NATIONAL HOSPITALS FOR NERVOUS DISEASES. The Board of Governors invites applications for the appointment of PHYSICIAN to the Department of Psychological Medicine (Consultant status) at The Maida Vale Hospital for Nervous Diseases, Maida Vale, W.9. Applicants must be Fellows or Members of the Royal College of Physicians of London and possess a qualification in psychological medicine. The appointment will be part-time and the successful applicant will be required to attend up to 4 half-days per week.

Applications (35 copies), giving the names of 3 referees, must be sent to the undersigned not later than 28th February, 1953.

H. EWART MITCHELL, Secretary,
The National Hospitals for Nervous Diseases.
Queen-square, W.C.1.

LEEDS. THE UNITED LEEDS HOSPITALS AND LEEDS REGIONAL HOSPITAL BOARD. SURGEON in Obstetrics and Gynæcology (Consultant status). Applications are invited for the part-time appointment of Assistant Surgeon in Gynæcology for duties at The Hospital for Women at Leeds ; Surgeon to The Maternity Hospital at Leeds; and Surgeon in Obstetrics and Gynæcology at hospitals in or near Leeds under the jurisdiction of the Leeds Regional Hospital Board. 9 sessions will be shared approximately equally between the teaching and non-teaching hospitals. Candidates must hold a higher qualification in these specialties and in general surgery and must have had first-class clinical experience over a number of years in obstetrics and gynæcology. They must also be prepared to satisfy the academic requirements of the University of Leeds for the teaching of both undergraduate and postgraduate students.

Full details of experience, qualifications, age and nationality, should be sent, together with the names of 3 referees, to the undersigned, by 14th March, 1953. Canvassing in any form will disqualify. S. CLAYTON FRYERS,

Secretary to the Joint Appointment Advisory Committee.
The General Infirmary at Leeds, Leeds, 1.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT THORACIC SURGEON for 5 half-days per week—4 half-days per week at the St. Helier Group Thoracic Surgery Unit, Carshalton, and 1 half-day per week between Croydon Group (Mayday Hospital) and Redhill Group (Redhill County Hospital).

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 14th March, 1953. Applicants may visit hospitals by local arrangement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Applications invited from registered medical practitioners with experience in tuberculosis and other chest diseases and in radiographic diagnosis of the chest for whole-time post of MEDICAL DIRECTOR, Mass Radiography Unit, Leicester Area. The person appointed will, whenever possible, undertake sessions at Central Leicester Chest Clinic and attend at Leicester Isolation Hospital and Chest Unit, Groby-road, Leicester. Appointee will be required to reside within 10 miles of Leicester. Salary £1300–£50–£1750.

Application forms and further details may be obtained from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Completed forms should be returned to the Secretary not later than 21st March, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time post of CONSULTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT at Prestwich Hospital, near Manchester (2800 Beds), where all modern forms of treatment are carried out. Wide experience in psychiatry essential. A house is available in the grounds at a moderate rental. Further inquiries may be made to the Medical Superintendent.

Forms of application may be obtained from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, and should be returned, with the names and addresses of 3 referees, to be received not later than 9th March, 1953.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. NICHOLAS HOSPITAL, GOSFORTH, NEWCASTLE UPON TYNE, 3. (1335 Beds.) CONSULTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT (whole-time). Salary £1700–£2750. Candidates must have had a wide experience in psychiatry and be competent to take clinical charge, subject to general administrative control of the Medical Superintendent, of a section of the Hospital and to participate in the work of the associated Outpatient Clinics and Domiciliary Consultant Service in the Area. The members of the clinical team act as Associate Physicians to the Department of Psychological Medicine, Newcastle General Hospital. Further particulars may be obtained from the Medical Superintendent of the Hospital. The post is resident ; a house is available.

Applications, with names and addresses of referees (preferably), or testimonials to a total of 3, to be sent to the Regional Psychiatrist, " Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified medical practitioners for the following appointments :—

Whole-time ASSISTANT RADIOLOGIST, based at the Victoria Infirmary, Glasgow. Salary on the scale £1300–£50–£1750.

Whole-time ASSISTANT ANÆSTHETIST, based at Falkirk Royal Infirmary. Salary on the scale £1300–£50–£1750.

The above appointments will be subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and giving the names of 3 referees, should be submitted not later than 30 days after the publication of this advertisement to the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a CONSULTANT SURGEON. The successful candidate will be based at Neath General Hospital (412 Beds), and will also be expected to serve other hospitals in the Mid Glamorgan Group. The successful candidate will be asked to state whether he wishes to hold a whole-time or maximum part-time appointment.

Applications (12 copies), stating age, and giving a summary of qualifications, experience, previous appointments with dates, and publications, together with the names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

NEW ZEALAND. DANNEVIRKE HOSPITAL BOARD. Applications are invited from registered medical practitioners for the position of MEDICAL SUPERINTENDENT of Dannevirke Hospital, Hawkes Bay, New Zealand. Salary scale £1410–£1660 (NZ) p.a. ; an unfurnished house, fuel and light will be provided at the value stated in the Hospital Employment Regulations, 1948. Should an overseas appointment be made, monetary assistance towards payment of fare is available for the appointee, his wife and dependent children.

Application forms and further information respecting the position may be obtained on application to the High Commissioner for New Zealand, 415, Strand, London, W.C.2, with whom applications close on 10th March, 1953.

Hospital Services : Junior Appointments

BROMPTON HOSPITAL, S.W.3. Applications invited for following posts :—

RESIDENT SURGICAL OFFICER (Senior House Officer grade) for 6 months from 1st May, with eligibility for reappointment. Candidates must have held a resident hospital appointment.

ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer grade) for 6 months from 1st May. Experience in artificial pneumothorax essential and in E.N.T. work desirable.

RESIDENT HOUSE PHYSICIAN, for which there are 3 vacancies, for 6 months from 1st May. Duties include work in Outpatient Department and wards. Salary £400 or £450 a year according to experience.

RESIDENT HOUSE PHYSICIAN at the Sanatorium at Frimley for 6 months from 1st May. Salary £400 or £450 a year according to experience.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 7th March to—

KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL SANATORIUM, Frimley. Applications invited for post of RESIDENT MEDICAL OFFICER. Candidates must have held a resident hospital appointment and be over 25 years of age. Salary within scale £700–£1000 p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials by 7th March to—

KENNETH A. F. MILES, House Governor.
Brompton Hospital, S.W.3.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER/HOUSE SURGEON (resident), House Officer grade.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary.

COLINDALE HOSPITAL, Colindale-avenue, London, N.W.9. HOUSE SURGEON, resident when on duty, required at the above Hospital to assist in thoracic, orthopædic, and genito-urinary surgery. Salary £400 p.a.–£450 p.a. according to experience. Deduction at the rate of £100 p.a. for board, lodging, &c. 6 months appointment.

Apply immediately, stating age, qualifications, experience, and enclosing up to 3 recent testimonials, to Physician-Superintendent.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR required in Morbid Anatomy and Histology Department at above Hospital. Whole-time, non-resident. Applicants may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 4th March, 1953.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT SENIOR HOUSE OFFICER required for Casualty Department. Successful candidate will work under supervision of orthopædic and traumatic Specialist. Preference given to applicant who has held resident surgical and medical posts in general hospitals. Post vacant immediately. Appointment for 6 months, subject to renewal for further 6 months.

Applications, with names of 2 referees or copies of 2 testimonials, to Medical Director by 28th February, 1953.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. (General Hospital of 147 Beds.) There will be a vacancy for a HOUSE SURGEON (pre-registration) on 1st April, 1953.

Applications, stating qualifications, age, nationality, and Medical School, with the names of 3 recent referees, should reach the undersigned on or before 14th March.

F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, Greenwich, S.E.10.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. (General Hospital of 142 Beds.) There will be a vacancy for a HOUSE PHYSICIAN (pre-registration) on 21st March.

Applications, stating age, qualifications, and experience, and giving the names of 3 recent referees, should reach the undersigned not later than 7th March. F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, Greenwich, S.E.10.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE SURGEON/CASUALTY OFFICER, with duties in Gynæcological and Special Departments. Appointment for 6 months from 1st April, 1953. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, as soon as possible.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE SURGEON, with charge of general surgical beds. Post recognised for F.R.C.S. examination. Appointment for 6 months from 1st April, 1953. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, as soon as possible.

GUY'S HOSPITAL, S.E.1. Applications are invited for the appointment of REGISTRAR to the Radiotherapy Department (middle grade). Duties to commence on 14th April, 1953.

Forms of application, obtainable from the Superintendent, Guy's Hospital, should be forwarded not later than 20th March, 1953.

GROUP LABORATORY, MILE END HOSPITAL, Bancroft-road, E.1. RESIDENT SENIOR HOUSE OFFICER in Pathology required. The Laboratory is well equipped with excellent training facilities.

Applications, stating age, qualifications and nationality, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, London, W.12. Whole-time NON-RESIDENT REGISTRAR (pædiatrics) required mid-May. Certain duties will be required at West London Hospital.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, the Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 9th March.

HIGHLANDS HOSPITAL, Winchmore Hill, London, N.21. (General Hospital—818 Beds.) HOUSE SURGEON required, vacant 1st March. Preference will be given to applicants seeking pre-registration posts under Medical Act, 1950.

Applications, with copies of 3 testimonials, to Hospital Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, N.W.8. Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcology Departments and to be responsible for the Casualty Department, to become vacant on Monday, 30th March, 1953. Appointment will be for a period of 6 months. Salary is at the rate of £350 p.a.

Applications should reach the Secretary on or before Monday, 2nd March, 1953, together with copies of 3 recent testimonials.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, N.W.8. Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON, to become vacant during the first week of March, 1953. Appointment will be for a period of 6 months. Salary is at the rate of £350 p.a.

Applications should reach the Secretary on or before Friday, 27th February, 1953, together with copies of 3 recent testimonials.

HACKNEY HOSPITAL, E.9. (811 Beds.) Hospital MANAGEMENT COMMITTEE, HACKNEY GROUP (NO. 6). Applications are invited for the appointment of CASUALTY HOUSE OFFICER (second or third post). 6 months appointment, vacant on 22nd March, 1953.

Applications, together with copies of 3 testimonials, should be sent to the Secretary, Hackney Group Hospital Management Committee, Hackney Hospital, E.9, not later than 7th March, 1953.

HAMPSTEAD GENERAL HOSPITAL, The Green, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the resident post of HOUSE PHYSICIAN, vacant 1st April, 1953, tenable for a period of 6 months. Preference will be given to candidates seeking pre-registration posts under the Medical Act, 1950.

Application forms may be obtained from the Administrative Officer, to whom they should be returned together with copies of 3 recent testimonials, by 27th February, 1953.

HAMPSTEAD GENERAL HOSPITAL, The Green, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the resident post of HOUSE SURGEON, vacant 1st April, 1953, tenable for a period of 6 months. Preference will be given to candidates seeking pre-registration posts under the Medical Act, 1950.

Application forms may be obtained from the Administrative Officer, to whom they should be returned together with copies of 3 recent testimonials, by 27th February, 1953.

HOSPITAL FOR TROPICAL DISEASES, 4, St. Pancras-way, N.W.1. (UNIVERSITY COLLEGE HOSPITAL.) Applications invited for post of RESIDENT MEDICAL OFFICER (Registrar grade) vacant 1st May, 1953. Salary £775–£890 p.a., less £100 p.a. for residence. Appointment for 6 months, renewable.

Applications, with names of 2 referees, to the Administrator and Secretary, University College Hospital, Gower-street, W.C.1, by 13th March, 1953.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER to the Tuberculosis Dispensary Clinic at the Hospital. Experience in diagnosis and treatment of tuberculosis essential.

Applications, stating age, qualifications with dates, previous appointments held, with copies of 3 testimonials, should be sent to the undersigned by 20th March, 1953.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of HOUSE PHYSICIAN. The appointment is for 6 months commencing on 1st April, 1953.

Forms of application may be obtained from the Physician-Superintendent at the Hospital.

PLAISTOW HOSPITAL, Samson-street, London, E.13. (179 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (House Officer—second or third post) for 6 months, commencing as soon as possible in the Chest Unit and Infectious Diseases Unit at this Hospital. The position offers valuable experience in both groups of diseases and is particularly useful to candidates sitting for the M.R.C.P. examination.

Candidates should send applications to the undersigned, together with copies of recent testimonials, by 7th March, 1953. M. J. HUNTLEY, Group Secretary,

West Ham Group Hospital Management Committee.

Stratford, London, E.15.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. SURGICAL REGISTRAR for general surgery. Resident whole-time. F.R.C.S. essential. Vacancy 1st May.

Application forms from Secretary, St. Luke's Hospital, Sydney-street, Chelsea, S.W.3, returnable by 7th March (enclose stamped addressed envelope, foolscap).

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. RESIDENT SURGICAL OFFICER (Senior House Officer grade) required to take charge of 32 surgical beds which are under the direction of the Surgical Consultant of Lambeth Hospital, Kennington; and also to work under the E.N.T. Consultant at the South Western Hospital.

For form of application apply to the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11.

ST. ANDREW'S HOSPITAL, Bow, E.3. Applications are invited from registered medical practitioners for appointment as SENIOR HOUSE OFFICER (Anæsthetist).

Applications, stating age, qualifications and experience, with copies of 3 testimonials, should be sent to the Group Secretary, Bow Group Hospital Management Committee, 2A, Bow-road, London, E.3.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of RESIDENT MEDICAL OFFICER in the grade of Senior House Officer, for duty at the Victoria Hospital for Children, Tite-street, Chelsea, S.W.3. Candidates for this post must have had resident hospital experience in the diseases of children. The post falls vacant on 1st May, 1953, but the successful applicant should be prepared to take up duty on 1st April, 1953.

Applications, together with the names of 2 referees, must be received by the undersigned not later than 2nd March, 1953.

P. H. CONSTABLE, House Governor.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, London, W.C.1, and Golden-square, W.1. There will be a vacancy in the grade of SENIOR HOUSE OFFICER as from 1st April, 1953, and applications are invited. The appointment is in accordance with the terms and conditions of service in the National Health Service, for an initial period of 6 months. Applicants should have good clinical experience in general surgery and in this specialty, and they should preferably hold a higher surgical qualification or have passed the Primary examination for the F.R.C.S.

Applications, giving full information as to qualifications and experience, with the names of 2 referees, should be sent to the House Governor before 28th February, 1953.

ROYAL DENTAL HOSPITAL OF LONDON, Leicester-square, London, W.C.2. Applications are invited for the post of SENIOR REGISTRAR or REGISTRAR. Applicants must possess a dental qualification. A medical qualification and/or additional dental qualification would be of considerable advantage. The post will be subject to the terms and conditions of service for medical and dental Officers.

Applications, giving age, nationality, experience and qualifications, together with names of 3 referees, should be forwarded to the Secretary-Superintendent not later than Saturday, 14th March, 1953.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified general medical practitioners, for appointment as Part-time MEDICAL OUTPATIENT ASSISTANTS (2 vacancies). The first vacancy is for 2 notional half-days per week, i.e., Wednesday P.M., and Friday A.M., the second for 1 notional half-day per week, i.e. Tuesday P.M. The salary will be at the rate of £175 p.a., per notional half-day, i.e., graded "General Practitioner." Successful candidates will be required to commence duty as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details of previous and present appointments, with grading, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, within 10 days of the appearance of this advertisement.

ST. NICHOLAS HOSPITAL, Plumstead, London, S.E.18. SENIOR HOUSE SURGEON, vacant immediately. Orthopædic and E.N.T. Surgery. Appointment for 6 months in first instance and may be renewed for further period. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. OLAVE'S HOSPITAL, Lower-road, S.E.16. Senior HOUSE OFFICER (pathology and general medicine) required at above Hospital. Salary £670 p.a. Appointment initially for a period of 1 year.

Applications, with copies of testimonials, within 7 days of publication, quoting Ref. L., to Secretary, Hospital Management Committee, New Cross General Hospital, Avonley-road, S.E.14.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR in Dental Surgery, required for 1 year in the first instance to carry out 5 sessions per week, commencing 1st April, 1953. Medical or other additional qualifications will be an advantage. The successful applicant may be required to carry out 6 sessions at another hospital.

Applications, including names and addresses of 2 referees, to Clerk of the Governors by 28th February, 1953.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a Whole-time ASSISTANT MEDICAL REGISTRAR (Registrar grade) on 16th April, 1953.

Further particulars and form of application, which must be returned not later than Monday, 2nd March, 1953, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies on 15th May, 1953, for the following Senior House Officers :—

HOUSE PHYSICIAN.

HOUSE SURGEON to the Orthopædic and Plastic Departments.

Further particulars and form of application, which must be returned not later than 2nd March, 1953, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th May, 1953, for a MEDICAL REGISTRAR AND PATHOLOGIST (Senior Registrar).

Further particulars and form of application, which must be returned not later than Monday, 2nd March, 1953, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WHITTINGTON HOSPITAL, N.19. Applications are invited for the following posts :—

*HOUSE PHYSICIANS (general medicine). 2 posts. Recognised for M.D. (London).

HOUSE PHYSICIANS (general medicine), third post held. 2 positions. Posts recognised for M.D. (London).

HOUSE PHYSICIAN (pædiatrics). Post recognised for D.C.H.

*HOUSE SURGEONS (general surgery). 2 posts. Recognised for F.R.C.S. (England).

HOUSE SURGEONS (general surgery). 2 posts. Posts recognised for F.R.C.S. (England).

HOUSE SURGEON (obstetrics). Post recognised for D.Obst.R.C.O.G.

All positions vacant 1st April, 1953.

* Preference will be given in these appointments to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications, stating age, qualifications, previous experience, together with copies of 2 recent testimonials and the name of 1 referee, to the Medical Superintendent, Whittington Hospital, Highgate Hill, N.19, by 2nd March, 1953.

WEST END HOSPITAL FOR NERVOUS DISEASES, housed at St. Charles Hospital, Ladbroke-grove, W.10. PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Half-time SURGICAL ASSISTANT (graded as Senior House Officer) for duty at the above Hospital. Candidates should have had surgical experience, and previous neurological or neurosurgical experience would be an advantage.

Applications, stating age, qualifications, experience, together with the names and addresses of 3 referees, to be forwarded to the Secretary to the Committee, Paddington Hospital, Harrow-road, W.9, by 14th March, 1953.

AYLESBURY. TINDAL GENERAL HOSPITAL. (276 Beds.) HOUSE SURGEON (Male or Female), vacant 1st April, pre-registration post, but registered practitioners invited to apply. The post offers wide experience of general surgery with operative practice. Recognised for F.R.C.S. Acute surgical Unit of 95 Beds, no Casualty Department.

Apply, with 2 testimonials, to the Administrative Officer.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOSPITAL. HOUSE SURGEON for Accident and Orthopædic Department, which is centred upon this Hospital and comprises 40 Beds.

Applications, with 2 testimonials, to Secretary-Superintendent as soon as possible.

AYLESBURY. STOKE MANDEVILLE HOSPITAL. (624 Beds.) RESIDENT HOUSE PHYSICIAN for Medical Department, vacant 14th April, 1953. Recognised pre-registration post ; applications from fully registered practitioners will be considered.

Apply, with copies of 2 testimonials, to Administrative Officer.

ACCRINGTON. VICTORIA HOSPITAL. (112 acute beds.) HOUSE PHYSICIAN required to take up duty at this busy general hospital on or about 1st March, 1953. Pre-registration post. National Health Service salary and conditions of service.

Applications should be sent to the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. 2 RESIDENT HOUSE PHYSICIANS (Male) required at above Hospital for general medical duties. 6 months appointments, 1 vacant on 1st April, 1 vacant 10th April. Preference given to pre-registration candidates. National Health Service salary and conditions of service.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to be sent to Medical Director of Hospital by 7th March, 1953.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited for the appointment of RESIDENT HOUSE SURGEON, which will become vacant on or about 16th February, 1953, at the above Hospital. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD (near), KENT. WILLESBOROUGH HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON which is now vacant at the above Hospital. Good experience in general surgery with some casualty work. Salary £350, £400, or £450 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, should be forwarded to the Group Secretary, South East Kent Hospital Management Committee, "Ash-Eton," Radnor Park West, Folkestone.

ASHTON, HYDE, AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Ashton under Lyne General Hospital (800 Beds)

HOUSE SURGEON (general surgery), vacant now. Recognised for F.R.C.S. Eng.

E.N.T. SURGEON (Senior House Officer grade), vacant now.

CASUALTY OFFICER (resident or non-resident). Recognised for F.R.C.S. Eng.

Manchester Regional Hospital Board

REGISTRAR in Radiology (resident or non-resident) in the Ashton Hyde, and Glossop group and Oldham and District Group of hospitals. Vacant now.

Appointments subject to Ministry of Health terms and conditions of service.

Applications, giving age, nationality, qualifications and experience, with copies of 3 testimonials, should be forwarded to R. W. MCVITY, Group Secretary.

Astley-road, Stalybridge, Cheshire.

ALTRINCHAM. ST. ANNE'S HOSPITAL, near MANCHESTER. (53 Beds—Recognised for D.L.O. examination. Staffed by Manchester Consultants.) NORTH AND MID CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (non-resident) E.N.T. Post offers excellent opportunities of practical experience to suitably qualified Officer, and is tenable for 12 months. Salary £670 p.a., and Ministry of Health conditions of service.

Applications, stating age, qualifications, &c., to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ANÆSTHETIST (Senior House Officer) required immediately. The post is recognised for the D.A. and is tenable for 12 months. Salary £670 p.a.

Applications to the Deputy Hospital Secretary at the Hospital.

BARNSTAPLE. NORTH DEVON INFIRMARY. (110 Beds.) HOUSE PHYSICIAN. Post vacant 1st March, 1953.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple

BARNET (near). CLARE HALL HOSPITAL, South MIMMS, BARNET, HERTS. (504 Beds for tuberculosis and diseases of the chest, including 76 Beds for thoracic surgery—tuberculous and non-tuberculous.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR required at above Hospital. Post vacant 13th April, 1953. Duties mainly medical, but some allocation of time to surgical wards. Good training in general medicine essential, and experience in diseases of the chest desirable. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Barnet Group Hospital Management Committee, 1, Wellhouse-lane, Barnet, Herts, by 4th March, 1953.

BARNET GENERAL HOSPITAL, Wellhouse-lane, Barnet, HERTS. (478 Beds.) RESIDENT HOUSE PHYSICIAN required for the Department of Medicine. Post vacant 1st March, tenable for 6 months. Preference will be given to persons seeking pre-registration posts under the Medical Act, 1950.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Hospital Secretary.

BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for a resident post of SENIOR HOUSE OFFICER in the Obstetrical and Gynæcological Department of the Group, to be based at the Risedale Maternity Hospital, Barrow-in-Furness. Hospital recognised for D.Obst.R.C.O.G. National salary and conditions of service (with deduction of £155 p.a. for emoluments).

Applications, stating age, qualifications, and experience, with 2 recent copy testimonials, to be forwarded to the Group Secretary, 52, Paradise-street, Barrow-in-Furness.

BEDFORD GENERAL HOSPITAL. (434 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required at above Hospital, whole-time, resident. Candidates may visit the Hospital by direct appointment. Post vacant 23rd March, 1953.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 27th February, 1953.

BEDFORD GENERAL HOSPITAL. (434 Beds.) Bedford GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON required, vacant on 4th March, 1953. Preference will be given to persons seeking pre-registration posts under the Medical Act, 1950. The appointment offers exceptional opportunities for general experience in a busy Acute Surgical Unit.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 testimonials, should be forwarded to the Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications invited for the following whole-time appointments :—

(*a*) **Hallam Hospital, West Bromwich** (440 Beds)

West Bromwich Group of hospitals. REGISTRAR in Pathology. Hospital recognised for Diploma in Pathology. Non-resident appointment.

(*b*) **West Bromwich and District General Hospital** (144 Beds)

West Bromwich Group of hospitals. REGISTRAR in General Surgery. Hospital recognised for F.R.C.S. Resident appointment. Experience in general surgery and possession of higher qualification an advantage.

(*c*) **Coventry and Warwickshire Hospital, Coventry** (346 Beds)

Coventry Group of hospitals. REGISTRAR in Orthopædics. Single accommodation available. Experience in specialty essential. Higher qualification an advantage.

(*d*) **Warneford Hospital, Leamington Spa** (207 Beds)

South Warwickshire Group of hospitals. REGISTRAR in E.N.T. Surgery. Duties also at Warwick Hospital (350 Beds) and Stratford Hospital (187 Beds). Non-resident appointment.

(*e*) **Gulson Hospital, Coventry** (311 Beds)

Coventry Group of hospitals. REGISTRAR in E.N.T. Surgery. Duties also at Coventry and Warwickshire Hospital (346 Beds) which is recognised for F.R.C.S. and D.L.O. and has Audiometric and Hearing-aid Departments. Non-resident appointment.

(*f*) **Highcroft Hall, Erdington** (1179 Beds)

Birmingham (Mental C) Group of hospitals. REGISTRAR in Psychiatry. Accommodation available for single person. Experience in specialty desirable.

(*g*) **Shelton Hospital, Shrewsbury** (1000 Beds)

Shrewsbury Group of hospitals. REGISTRAR in Psychiatry. Hospital recognised for D.P.M. Opportunities for outpatient clinic work. Accommodation for single person. General hospital experience an advantage.

(*h*) **Royal Hospital, Wolverhampton** (310 Beds)

Wolverhampton Group of hospitals. REGISTRAR in Dermatology. Successful candidate may also be required to work in neighbouring group. Non-resident appointment. Experience in specialty essential.

Application forms from Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 9th March, 1953.

BIRMINGHAM (near). CANWELL HALL BABIES' HOSPITAL. (60 Beds for babies and children up to the age of 12 years—2 House Physicians. Recognised for D.C.H.) HOUSE PHYSICIAN (Male or Female), vacant 1st April. This post includes attendance at outpatient clinics and neonatal departments in Birmingham Hospitals and a Child Welfare Centre.

Applications for the above appointment should be sent to the Pædiatrician, Sorrento Maternity Hospital, Birmingham, 13, immediately.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds.) Applications are invited from registered practitioners for the posts of :—

RESIDENT SURGICAL OFFICER (Senior House Officer grade), vacant 1st April, 1953. Salary at the rate of £670 p.a., less £140 p.a. in respect of emoluments.

HOUSE SURGEONS (Male or Female). Posts vacant 1st April and 1st May, 1953. Recognised for F.R.C.S. The appointments will be for a period of 6 months of which 2 may be spent in the Burns Unit (Medical Research Council).

The Hospital is the largest Traumatic Unit in the country and treats 50,000 new patients each year. The posts offer ample opportunity for practical experience in the management of all types of injury, and teaching by the Consultant staff.

Applications, accompanied by copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM, 18. WINSON GREEN HOSPITAL. BIRMINGHAM (MENTAL A) GROUP NO. 5 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 posts of SENIOR HOUSE OFFICER (Male or Female). Salary at the rate of £670 p.a. (less a charge of £120 p.a. for board and lodging if resident). The post, which will be for 1 year in the first instance, will be subject to the terms and conditions of service for medical and dental staffs and subject to the National Health Service superannuation regulations. The Hospital is associated with the University of Birmingham for the teaching of psychiatry, and training for the Diploma in Psychological Medicine will be provided.

Applications, stating age and qualifications, to be sent to the Medical Superintendent at the Hospital.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE BIRMINGHAM MATERNITY HOSPITAL, Loveday-street, BIRMINGHAM, 4. OBSTETRIC HOUSE SURGEON required. The appointment is for a period of 6 months and is recognised for the M.R.C.O.G. Duties commence 1st May, 1953.

Application forms can be obtained from the House Governor at the Birmingham and Midland Hospitals for Women, Showell Green-lane, Sparkhill, Birmingham, and should be returned not later than 2nd March, 1953. G. A. PHALP, Secretary.

The United Birmingham Hospitals.

AMENDED ADVERTISEMENT

BIRMINGHAM. HOLLYMOOR HOSPITAL. (640 Beds.) BIRMINGHAM (MENTAL B) GROUP OF HOSPITALS. Applications invited for appointment of Whole-time REGISTRAR in Psychiatry. Hospital recognised for D.P.M. Resident or non-resident appointment. Experience in specialty an advantage. Post offers good experience in diagnosis and treatment of psychosis and neurosis.

Application forms from Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 9th March, 1953.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAY-MEADS HOSPITAL. (350 occupied beds. Midway between London and Cambridge. Main Line from Liverpool Street.) Applications are invited from registered medical practitioners for the following :—

HOUSE OFFICER (Medical), Male or Female (first, second, or third post held), with primary attachment to the Pædiatric Ward of 24 Beds, and other duties in connection with 8 skin beds and Casualty Department. Salary £350–£450 p.a.

HOUSE OFFICER (Medical), Male or Female (first or second post held). Salary £350–£400 p.a.

Both appointments to commence 1st April, 1953, for period of 6 months and subject to residential emoluments of £100 p.a.

Applications, stating nationality, age, qualifications and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary as soon as possible.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOS-PITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary REGISTRAR (anæsthetics) at the above Hospital. Appointment to commence immediately, for approximately 6-month period. Salary at the rate of £775–£890 p.a., less £130 p.a. residential emoluments.

Applications, giving fullest details, together with copies of recent testimonials or the names of referees, to the Hospital Secretary.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOS-PITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary SURGICAL REGISTRAR at the above Hospital. Appointment to commence 3rd March, 1953, for a period of 6 months. Salary at the rate of £775–£890 p.a., less £130 p.a. for residential emoluments.

Applications, giving fullest details, together with copies of recent testimonials or the names of referees, to the Administrative Officer.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical, and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (first or second post held). Salary £350–£400 p.a., less £100 p.a. for residential emoluments. Appointment to commence 1st March, 1953.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or the names of referees, should be sent to the Administrative Officer, Haymeads Hospital, Bishop's Stortford, Herts.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (499 staffed beds.) RESIDENT SENIOR HOUSE OFFICER in the Department of Plastic and Jaw Surgery.

Applications, with full particulars, to the Group Secretary, Frenchay Hospital, Bristol.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. HOUSE SURGEON required to work in Plastic and Jaw Surgery Unit.

Applications, with full particulars, should be sent to the Group Secretary, Frenchay Hospital, Bristol.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the resident posts of SURGICAL REGISTRAR at Queen's Park Hospital, Blackburn, which is a mixed General Hospital of 644 Beds, and at Victoria Hospital, Accrington, which contains 112 acute beds. Both posts are recognised for F.R.C.S. and will be tenable for 1 year in the first instance. National Health Service salary and conditions of service apply.

Application forms should be obtained from, and returned to, the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (244 Beds.) HOUSE SURGEON required to take up duty on or about 1st March, 1953. Approved pre-registration post and recognised for F.R.C.S. National Health Service salary and conditions of service.

Applications should be sent to the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.) RESIDENT HOUSE SURGEON (Surgical Department). This post is recognised by the Royal College of Surgeons as a qualifying appointment for the Final examination. This is a busy General Hospital with a large Outpatient Department and the post offers excellent opportunities for general experience under Consultant Surgeons. Pre-registration post under Medical Act, 1950. Salary and conditions of service in accordance with national scale.

Applications, with references, should be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.) SENIOR HOUSE OFFICER (Department of Anæsthetics), vacant 22nd March, 1953. Recognised for the D.A. This is a busy General Hospital and the post offers excellent opportunities for experience under Consultant Anæsthetists. Salary and conditions of service in accordance with national scale (i.e., £670 p.a.)

Applications, with references, should be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

WALTER R. SMITH, Group Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.) SENIOR HOUSE OFFICER (E.N.T. Department). The post is recognised for the D.L.O. and F.R.C.S. and is vacant 31st March, 1953. This is a busy General Hospital with a large Outpatient Department and the post offers excellent opportunities for experience under Consultant Aural Surgeons. Salary £670 p.a. National Health Service conditions of service.

Applications, with references, should be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

BRADFORD CHILDREN'S HOSPITAL. (102 Beds.) Locum HOUSE OFFICER (Female), 1st April–31st July. Salary £8 p.w., less residential emoluments at rate of £100 p.a. Hospital recognised for D.C.H.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY.

HOUSE SURGEON or SENIOR HOUSE SURGEON (general and urology), vacant 1st March, 1953. Salary £350–£450 p.a., less £100 p.a. residential emoluments, or £670 p.a., less £130 p.a. residential emoluments.

Locum HOUSE SURGEON (general and urology), 16th March–30th April. Salary £8 p.w., less residential emoluments at rate £100 p.a.

HOUSE OFFICER (anæsthetics), vacant 1st April. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications for all above posts, stating age, nationality, qualifications and experience with copy testimonials, to Secretary.

BRADFORD. ST. LUKE'S HOSPITAL.

SENIOR HOUSE OFFICER (pathology), vacant 1st May. Salary £670 p.a., less £130 p.a. residential emoluments.

Locum ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now to 31st July. Recognised for F.R.C.S.

Locum HOUSE SURGEON (general and plastic), vacant 1st April–31st July.

Locum HOUSE OFFICER (medicine and dermatology), 1st March–31st July.

Salary for above 3 posts £8 per week, less residential emoluments at the rate of £100 p.a.

Applications for all above posts, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. House Officer (anæsthetics), vacant 1st March. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S MATERNITY HOSPITAL. HOUSE SURGEON (obstetrics and gynæcology), vacant 1st March. Recognised for D.Obst.R.C.O.G., M.R.C.O.G. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. CASUALTY HOUSE SURGEON required (1 of 2—attached to the Orthopædic and Traumatic Unit), now vacant.

Applications, giving details of qualifications, age, and experience, together with the names and addresses of 2 referees, to be sent to the Administrative Officer as soon as possible.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS for duties in the E.N.T. Department of the Group hospitals (78 Beds), vacant now. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., and names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7, as soon as possible.

BRIGHTON. SUSSEX EYE HOSPITAL. (56 Beds.) HOUSE SURGEON for above Hospital, vacant immediately. Recognised for D.O. Successful applicant will be considered for senior post (Senior House Officer) on completion of 6 months.

Applications, giving details of qualifications and experience, together with names and addresses of 2 referees, to the Administrative Officer.

BRIGHTON GENERAL HOSPITAL. House Surgeon (recognised for F.R.C.S.) for the General Surgical Unit (60 Beds). The post will be vacant 28th February, 1953. Salary in accordance with national scale.

Applications, stating age, qualifications, experience, and naming 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BRENTWOOD MENTAL HOSPITAL, Brentwood, Essex. SENIOR HOUSE OFFICER required. The Hospital is situated within easy reach of London by main line electric service and bus. There are over 2000 Beds, and a wide experience of all types of mental disorders (including the neuroses) can be obtained. All modern treatments are carried out, including psychosurgery. Visiting Consultants in other specialties attend regularly. Teaching by senior staff and facilities for attending postgraduate courses are provided; also experience of outpatient clinics. Regular clinical meetings are held. The successful applicant will work under the direction of a Consultant Psychiatrist. Library, private bedroom and individual sitting-room are provided. Indoor and outdoor recreational facilities. The post may be non-resident. Salary at the rate of £670 p.a., less a reasonable charge for residential emoluments.

Applications, stating age, experience and qualifications, should be sent to the Physician-Superintendent, with the names of 2 referees.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) Applications are invited for the following vacancies:—

RESIDENT HOUSE SURGEONS.

(1) General Surgical and Gynæcological Units.

(2) Casualty and Orthopædic Departments.

Both posts offer excellent experience.

Applications, giving full details of age, qualifications, experience, together with testimonials or names for reference, should be addressed to J. E. SMITH, Group Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE.

Bury General Hospital

SENIOR HOUSE OFFICER (orthopædics).

Applications are invited for the above post and should indicate age, nationality, qualifications, and experience, and should be sent to the undersigned as soon as possible.

RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) with duties mainly at Bury General Hospital. The post, tenable for 1 year, affords opportunities for gaining experience in all branches of pathology. Salary and conditions of service as Ministry of Health scale.

Applications, stating nationality, age, qualifications, and experience, along with names of 2 referees, should be forwarded immediately to the undersigned at Bury General Hospital, Walmersley-road, Bury, Lancs.

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House OFFICER to Departments of Dermatology, Ophthalmology, and Pædiatrics for 6 months from 11th April, 1953. Recognised pre-registration service.

Apply, stating age, nationality, qualifications, and experience with dates, and copies of 3 testimonials, to Secretary by 4th March. Interviews 16th March.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. ORTHOPÆDIC HOUSE SURGEON for 6 months from 27th March, 1953. Recognised pre-registration service.

Apply, stating age, nationality, qualifications, and experience with dates, and copies of 3 testimonials, to Secretary, by 28th February.

CAMBRIDGE. PAPWORTH SANATORIUM. House PHYSICIAN. Applicants must have held resident surgical and medical posts in a general hospital. Appointment for 6 months, and salary at rate of £400–£450 p.a., according to experience, less £100 for residential emoluments.

Applications should be sent to the Secretary, Papworth Group Hospital Management Committee, Papworth Hall, Cambridge, accompanied by 3 recent testimonials.

CHICHESTER, SUSSEX. GRAYLINGWELL HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR (whole-time) at the above Hospital. Applicants should have had wide psychiatric experience and possession of the D.P.M. or its equivalent is essential. The Hospital provides a full psychiatric service for its catchment area, including extensive extramural activities and the staffing of 3 Outpatient Clinics. There are also an active Research Department under its own Clinical Director, a Department of Clinical Psychology, and a modern Electroencephalographic Unit. The post offers excellent opportunities for obtaining comprehensive experience in both the neuroses and psychoses and for the carrying out of original work.

Application forms for which a stamped addressed envelope should be supplied, may be obtained from the Group Secretary, Graylingwell Hospital, Chichester, and 5 copies should be returned to him duly completed not later than 14 days after the appearance of this advertisement. Canvassing will disqualify.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) Applications are invited for the post of HOUSE PHYSICIAN for 6 months only in the first instance. Post vacant 7th March. The man or woman appointed will work primarily in the medical wards of the Hospital.

Applications, stating age, qualifications and experience, together with names of 2 referees, should be sent to the Surgeon-Superintendent immediately.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. Salary, first post £350, second post £400, third post £450 p.a., less £100 p.a. charge for residence. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. 6 Residents including Resident Surgical Officer and 3 House Surgeons. Vacant from 8th March, 1953.

Apply to Senior Administrative Officer of Hospital.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at above Hospital. Post recognised for F.R.C.S. Resident staff of 6: Resident Surgical Officer; 3 House Surgeons; Resident Medical Officer; and House Physician. Salary £670 p.a., less residential charge. Vacant from 22nd February, 1953.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer as soon as possible.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (265 Beds.) E.N.T. AND EYE HOUSE SURGEON. The above post, which is recognised for the D.L.O. and D.O.M.S. examinations, is now vacant. National Health Service salary and conditions.

Applications to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (265 Beds.) GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON. The above post, which is recognised for the F.R.C.S. Diploma, is now vacant. National Health Service salary and conditions.

Applications to be addressed to the Hospital Secretary at the above Hospital.

CAMBORNE. TEHIDY HOSPITAL. (189 Beds.) West CORNWALL HOSPITAL MANAGEMENT COMMITTEE. There is a vacancy for a RESIDENT HOSPITAL OFFICER for which applications are invited from registered medical practitioners. Practitioners convalescent from tuberculosis will be favourably considered. This is an appointment which offers good scope in this branch of medicine.

Applications, together with copies of 2 recent testimonials, should be addressed to the Hospital Secretary, Tehidy Hospital, Camborne.

CARDIFF. THE UNITED CARDIFF HOSPITALS. SENIOR HOUSE OFFICER required in the Casualty Department.

Application forms from Secretary, Cardiff Royal Infirmary.

CARDIFF. THE UNITED CARDIFF HOSPITALS. HOUSE SURGEON required in the Ophthalmic Department at Cardiff Royal Infirmary.

Application forms from Secretary, Cardiff Royal Infirmary.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) Cardiff HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER required immediately for Accident Unit.

Applications to Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (160 Beds). Applications are invited for the post of RESIDENT HOUSE OFFICER (medical). Salary £350, £400, £450 p.a., according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees to Group Secretary, West Wales Hospital Management Committee Glangwili, Carmarthen.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER (casualty). Salary £670 p.a., less £125 emoluments. The appointment will be tenable for 1 year in the first instance.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHESTER. BARROWMORE HOSPITAL, Great Barrow, CHESTER. (205 Beds.) SENIOR HOUSE OFFICER (Male). Post vacant immediately. Salary £670, subject to deduction of £120 p.a. for residence. The Hospital is modern in all respects and contains Regional Thoracic Surgical Unit.

Apply immediately, sending 2 references or names of referees, to Secretary.

CHESTER (near). MEADOWSLEA HOSPITAL. WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident). Salary £700–£1000 p.a., less recognised charge for services provided by Hospital. The appointed candidate will be a member of a chest team covering a wide area in North Wales with excellent opportunities for experience in hospital and chest clinic practice. A flat is available for the successful candidate.

Applications, stating age, qualifications, experience, together with the names of 3 referees, to the Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, within 14 days.

CHESTERFIELD ROYAL HOSPITAL. Chesterfield HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration House Officer or Senior House Officer) is required immediately at above Hospital. National salary and conditions.

Apply M. H. BOONE, Secretary.

CHESTERFIELD ROYAL HOSPITAL. Senior House OFFICER required in Accident and Orthopædic Department of the above Hospital. National salary and conditions.

Applications to— M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. (324 Beds.) A RESIDENT ANÆSTHETIST (Senior House Officer grade) is required immediately at the above Hospital. The post is recognised for the D.A. examination. Experience in all types of anæsthetics, except neurosurgery, can be obtained at this Hospital. The salary payable is £670 p.a., less a deduction for residential emoluments.

Please write for interview to—
M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

DARTFORD HOSPITAL MANAGEMENT COMMITTEE.

HOUSE OFFICER (E.N.T. and ophthalmology) at The Southern Hospital, Dartford.

HOUSE OFFICER (chest diseases) at The Bow Arrow Hospital, Dartford.

Applications, stating age, qualifications, experience, nationality, and the names of 2 persons to whom reference may be made, to be sent to the Medical Superintendent of the hospital concerned.

DENBIGH (near). LLANGWYFAN HOSPITAL. Clwyd AND DEESIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the appointment of a HOUSE OFFICER at the above Hospital. The Hospital has a total complement of 400 Beds and provides for all types of pulmonary and non-pulmonary tuberculosis and also contains a major Thoracic Surgical Unit.

Applications, stating full name, age, nationality, professional qualifications, particulars of present and previous hospital appointments, to be addressed to the undersigned, together with the names and addresses of 2 referees, to reach him within 14 days from the date of publication of this advertisement.

WILLIAM ROBERTS, Group Secretary.
"Rhianfa," Russell-road, Rhyl.

DERBY CITY HOSPITAL. Sheffield Regional Hospital BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of REGISTRAR (obstetrics) to the above Hospital, which is recognised for training in obstetrics for the D.Obst.R.C.O.G. and the M.R.C.O.G. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 2nd March, 1953.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of CASUALTY REGISTRAR to the above Hospital. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 9th March, 1953.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE SURGEON at this busy General Hospital. The post becomes vacant at the end of February, 1953, and offers wide experience in congenial surroundings. Salary at the rate of £350, £400, or £450 a year, according to experience, subject to a deduction of £100 a year in respect of residential emoluments. There are 4 residents on the staff. The appointment is tenable for 6 months in the first instance.

Applications, giving full particulars, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOVERCOURT, ESSEX. HARWICH AND DISTRICT HOSPITAL. (30 Beds.) Applications invited for appointment of SENIOR HOUSE OFFICER (Resident Surgical Officer). Tenable for period of 1 year. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DUNDEE ROYAL INFIRMARY. Senior House Officer in Anæsthetics.

Apply, with 2 references, to the Medical Superintendent by 23rd March.

DURHAM. DRYBURN HOSPITAL. (319 Beds.) Durham HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required in Children's Department. Post recognised for D.C.H Vacant now.

Applications (2 referees) to Group Secretary, Dryburn Hospital, Durham.

DURHAM. DRYBURN HOSPITAL. (319 Beds.) Durham HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Locum) required in Children's Department for 3 weeks commencing 25th February, 1953.

Applications to Group Secretary, Dryburn Hospital, Durham

EDGWARE, MIDDLESEX. NORTH LONDON BLOOD TRANSFUSION CENTRE. JUNIOR HOSPITAL MEDICAL OFFICER required for full-time duty to work with mobile teams at donor sessions. Opportunity for training in clinical pathology exists.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, not later than 28th February, 1953.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. SENIOR SURGICAL CASUALTY HOUSE OFFICER (resident) required. Salary £670 p.a. Deduction of £130 p.a. for board, lodging, &c. Post vacant 28th March, 1953.

Applications, together with the names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, not later than 7th March, 1953.

EDGWARE GENERAL (formerly Redhill County) HOSPITAL, EDGWARE, MIDDLESEX. RESIDENT HOUSE PHYSICIAN. Post vacant 7th April, 1953. Salary £350–£450 according to experience. Deduction of £100 p.a. for board, lodging, &c. 6 months appointment.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 7th March, 1953. Candidates selected for interview will be notified by 14th March, 1953.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds. 85 general surgical beds, including E.N.T., Oral and Facio-maxillary Unit.) Applications are invited for the appointment of HOUSE SURGEON for general surgery, including duties in E.N.T. and Eye Department, to fill an immediate vacancy. Busy General Hospital with easy access to London. Salary on national scale, less a deduction at the rate of £100 p.a. for board, lodging, &c. The successful candidate will be favourably considered for a House Physician post on the termination of this appointment.

Applications, with copies of 2 recent testimonials, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, by 27th February, 1953.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. Applications are invited for the following whole-time appointments of REGISTRARS in Psychiatry :—

(*a*) St. Andrew's Mental Hospital, Thorpe, Norwich (1230 Beds). Married or single accommodation available.
(*b*) St. Audry's Mental Hospital, Melton, near Woodbridge, Suffolk (1075 Beds). Single accommodation available.
(*c*) St. Clement's Mental Hospital, Ipswich (445 Beds). Quarters for single man available.

Preference for any particular post should be stated. Appointments will be for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, with names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 9th March, 1953. Candidates invited to visit hospitals by direct arrangement with the appropriate Medical Superintendent.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER in Anæsthetics required, vacant 12th April, 1953. Post recognised for the D.A. 12 months appointment.

Applications, stating age, nationality, qualifications, past and present appointments, and the names of 2 referees, to the Secretary of the Management Committee by 27th February, 1953.

EDINBURGH NORTHERN GROUP OF HOSPITALS. HOUSE PHYSICIAN required for Neurological Unit, Northern General Hospital, for 6 months commencing 1st April, 1953. Salary £350–£450 p.a. according to experience, with deduction of £100 for board and lodging.

Applications to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. HOUSE PHYSICIAN required for the Rheumatic Diseases Unit, Northern General Hospital, for 6 months commencing 1st April, 1953. Salary £350–£450 p.a. according to experience, with deduction of £100 for board and lodging.

Applications to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. HOUSE SURGEON required for Thoracic Unit, Eastern General Hospital, for 6 months commencing 1st April, 1953. Salary £350–£450 p.a. according to experience, with deduction of £100 for board and lodging.

Applications to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. HOUSE SURGEON required for the Urological Unit, Western General Hospital, for 6 months commencing 1st April, 1953. Salary £350–£450 p.a. according to experience, with deduction of £100 p.a. for board and lodging.

Applications to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EXETER CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of SENIOR REGISTRAR in General Surgery. Applicants should have had wide experience in general and emergency surgery. The appointment will be held for 1 year in the first instance but may be renewed thereafter on an annual basis. The successful candidate will be required to work for the first year mainly at the Royal Devon and Exeter Hospital, Exeter, and to visit other hospitals in the Clinical Area as may be required by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications, and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 14th March, 1953.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female), for the appointment of HOUSE SURGEON (Obstetric and Gynæcological Department), vacant 1st March, 1953. The appointment is for a period of 6 months.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the post of CASUALTY OFFICER and to act as House Surgeon to the E.N.T. Department, with alternate weekends on duty for the Obstetric and Gynæcological Department, now vacant. The appointment is for a period of 6 months.

Applications, with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary immediately.

GLASGOW. HAWKHEAD (MENTAL) HOSPITAL, 510, Crookston-road, GLASGOW, S.W.3. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Salary scale £700–£50–£1000 p.a., with appropriate deduction if resident. There is scope for comprehensive experience in all aspects of psychiatry, inpatient and outpatient, and all modern methods of treatment are used.

Applications, with the names of 2 referees, should be forwarded as soon as possible to the Physician-Superintendent, from whom further details can be obtained.

GRANGE-OVER-SANDS. WESTMORLAND SANATORIUM, MEATHOP, GRANGE-OVER-SANDS. Applications are invited from registered medical practitioners for the appointment of HOUSE OFFICER (resident) up to Junior Hospital Medical Officer grade according to experience. The Sanatorium contains 160 Beds (male and female).

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be sent to the Secretary of the Lancaster and Kendal Hospital Management Committee, Royal Lancaster Infirmary, Lancaster.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL. NORFOLK AND NORWICH GROUP. EAST ANGLIAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR. The post offers wide experience in all aspects of general surgery. Appointment for 1 year renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 2nd March, 1953. Candidates invited to visit the Hospital by direct arrangement with the Secretary-Superintendent at the Hospital.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post, now vacant (and recognised for the D.L.O.), of SENIOR HOUSE OFFICER, with duties in Surgical and E.N.T. Departments.

Applications, with names of 2 referees, to Hospital Secretary, Grimsby General Hospital.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (162 Beds—recognised by Royal College of Surgeons.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, £450 p.a., according to experience, less £100 p.a. for board and residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (162 Beds.) Applications are invited for the post of RESIDENT HOUSE OFFICER (medical). Salary £350, £400, £450 p.a., according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) CASUALTY HOUSE OFFICER (Male or Female), first, second, or third post held, with attachment to Pædiatrician and Ophthalmic Consultant. Salary £350–£450 p.a., less £100 p.a. residential emoluments. Appointment to commence immediately.

Applications, with full details and references, to Secretary, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of HOUSE SURGEON (Male or Female), second post, for general surgery. R practitioners holding first post may apply. 6 months appointment. Salary at rate of £400 p.a., less £100 p.a. for residential emoluments. Duties to commence as soon as possible.

Applications to Group Secretary, Hertford Group Hospital Management Committee, County Hospital, Hertford, Herts.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. HOUSE PHYSICIAN (resident). Appointment recognised for M.D.(Lond.) Branch 1, and for pre-registration House Officers. Whole-time duties under Medical Director.

Applications, stating age, qualifications, nationality, and experience, together with copies of not more than 3 recent testimonials, to Medical Director of Hospital by 2nd March.

HITCHIN HOSPITALS, Hitchin, Herts. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN at the Lister Hospital, vacant 1st April, 1953. Post recognised for pre-registration service.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 testimonials, should be sent to the Medical Director, Lister Hospital, Hitchin, Herts.

HALIFAX GENERAL HOSPITAL. (86 midwifery beds : 40 gynæcological beds.) SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required. Male or Female. Post vacant 31st March. Recognised for M.R.C.O.G. 1450 deliveries annually. Duties also at Royal Halifax Infirmary (46 midwifery beds and 10 gynæcological beds ; 530 deliveries annually). Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax, Yorkshire.

HALIFAX AREA HOSPITALS MANAGEMENT COMMITTEE. 2 SENIOR HOUSE OFFICERS required in the Anæsthetic Departments at Royal Halifax Infirmary (301 Beds) and Halifax General Hospital (425 Beds); both busy acute general hospitals. Opportunities for studying for D.A. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, to be forwarded to Group Secretary, Royal Halifax Infirmary, Halifax, Yorkshire.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) CASUALTY AND ORTHOPÆDIC HOUSE SURGEON. Post now vacant. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ST. HELEN'S HOSPITAL. (453 Beds.) HOUSE PHYSICIAN. Pre-registration post now vacant, Male or Female, resident. National scale of salary.

Apply to Hospital Administrator.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (262 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade) at the above Hospital, to commence duties on 16th March, 1953. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs—£700–£50–£1000.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (resident), Senior House Officer, required to commence duty on 20th April, 1953. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs, £670 a year, less £130 in respect of residential emoluments.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in Ophthalmology (non-resident), to commence duties immediately. The post is recognised for the Diploma in Ophthalmology. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, should be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (398 Beds.) Applications are invited for the following resident appointments:—

SENIOR SURGICAL HOUSE OFFICER. Salary £670 p.a., less £130 for emoluments. Successful candidate to supervise work of 2 House Surgeons in general, orthopædic and gynæcological work; opportunity to undertake operative work and emergency surgery.

2 HOUSE OFFICERS. 1 mainly gynæcology and 1 general surgery. Salary £350, £400 or £450 p.a., according to experience.

Posts now vacant.

Applications, with full particulars to the Secretary, Hull A Group Hospital Management Committee.

HUNTINGDON COUNTY HOSPITAL. The Hospital is approved by the licensing authority for pre-registration service and applications are invited for the post of JUNIOR HOUSE OFFICER (surgical). The Hospital is a busy one and is staffed by Consultants from Cambridge. There is also a full-time Senior Hospital Medical Officer on the staff.

Applications, giving full particulars and names of 2 referees, to the Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket, Suffolk.

ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE.

CASUALTY OFFICER, St. Mary's Hospital, Newport (365 Beds). Salary £670, less £130 for accommodation and services. Model Casualty Department, newly constructed.

HOUSE SURGEON, Royal I.W. County Hospital, Ryde (119 Beds). Post recognised for F.R.C.S. and approved for pre-registration service. Salary on national scale.

Applications, with full details, to Chief Administrative Officer, Clatterford House, Carisbrooke, I.W.

ISLE OF WIGHT GROUP. South West Metropolitan REGIONAL HOSPITAL BOARD requires Whole-time Locum SENIOR ORTHOPÆDIC REGISTRAR in the above Group, for 3 months from 23rd March, 1953. Salary £22 per week. The Group's orthopædic work is based on the Royal Isle of Wight County Hospital, Ryde, in which district the Locum will be required to live, accommodation being provided. He will have the care, under the Consultant Surgeons, of the orthopædic beds at the Royal Isle of Wight County Hospital and will be expected to take certain clinics at Ryde and at peripheral hospitals at Shanklin and Cowes.

Applications immediately to Dr. J. REVANS.
Beeston House, Water-lane, Winchester.

KETTERING GENERAL HOSPITAL. (166 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE OFFICER in Traumatic, Orthopædic and Casualty work, to commence immediately for a period of either 6 or 12 months. There are 5 House Officers and full Consultant staff. Salary, &c., in accordance with national scale.

Applications, giving age, nationality, qualifications, any previous experience, and copies of 2 recent testimonials, should be sent as soon as possible to the Group Secretary, General Hospital, Kettering.

KETTERING GENERAL HOSPITAL. (166 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Medicine (non-resident), which will be vacant on 7th March. There are 5 House Officers and full Consultant Staff. This post involves assistance with outpatient clinics in general medicine and pædiatrics with over-all responsibility for the 32 acute medical beds and electrocardiograph Department.

Applications, stating age, nationality, qualifications, past experience, and enclosing copies of 2 recent testimonials, should be forwarded as soon as possible to the Group Secretary, General Hospital, Kettering, Northants.

KETTERING GENERAL HOSPITAL. (166 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (Anæsthetist), resident, which becomes vacant immediately. The appointment is tenable for 1 year in the first instance. Salary in accordance with Ministry of Health terms and conditions of service. The Hospital is recognised for training for the Diploma in Anæsthetics.

Applications, together with copies of 3 recent testimonials, to be sent to the Group Secretary, Kettering General Hospital, immediately.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. (Recognised hospital for pre-registration service.) RESIDENT HOUSE SURGEON required for this acute general hospital. Post vacant immediately.

Applications with the names of 3 referees to the Hospital Secretary.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts:—

Anæsthetics

(*a*) Hull A Group with additional duties at hospitals in Hull B and East Riding Groups (non-resident).

(*b*) Huddersfield Group (resident or non-resident).

(*c*) York A and Tadcaster Group (non-resident).

Chest Diseases

(*a*) Middleton Hospital, near Ilkley (400 Beds). There are good surgical and radiological facilities and both pulmonary and non-pulmonary cases are treated. Residential accommodation is available for a single person.

(*b*) Scotton Banks Sanatorium, Knaresborough (resident).

General Medicine

Rheumatism Centre, Harrogate, and the Rheumatism Clinic at Leeds General Infirmary (non-resident). This appointment offers considerable scope for experience in rheumatic diseases.

Infectious Diseases

Leeds Road Hospital, Bradford (resident).

Obstetrics and Gynæcology

Dewsbury, Batley and Mirfield Group (resident)—not yet recognised for M.R.C.O.G.

Orthopædic Surgery

(*a*) Pontefract and Castleford Group (resident).

(*b*) General Hospital, Batley, and other hospitals in the Dewsbury, Batley and Mirfield Group (resident).

(*c*) Bradford Royal Infirmary with additional duties as required at other Orthopædic Units in the Bradford A Group (non-resident).

Otolaryngology

(*a*) Huddersfield and Halifax Groups. Appointment is non-resident but successful candidate will be required to reside in Huddersfield.

(*b*) Hull Royal Infirmary and associated hospitals (non-resident).

Both Departments are recognised for the Fellowship and the D.L.O.

Pathology

(*a*) St. James's Hospital, Leeds, and the Regional Blood Transfusion Centre, Seacroft, Leeds (non-resident). This joint post will give considerable opportunity for experience in all branches of pathology, especially hæmatology.

(*b*) Harrogate and District General Hospital, Harrogate Royal Bath Hospital (rheumatism), and Scotton Banks Hospital, Knaresborough (tuberculosis). (Non-resident.)

Psychiatry

Stanley Royd Hospital, Wakefield (2000 Beds). Residential accommodation is available for a single person.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 28th February, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the appointment of REGISTRAR in Pædiatrics (non-resident) for duties at hospitals in the Huddersfield and Halifax Hospital Management Committee Group.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 28th February, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following SENIOR REGISTRAR posts:—

Pathology

Leeds A and B Groups. Duties will be mainly at St. James's Hospital (1800 Beds) and good experience of morbid anatomy is essential. The work would be so arranged that some time could be devoted to research problems.

Radiology

Huddersfield and Halifax Groups (non-resident).

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 7th March, 1953.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of RESIDENT ORTHOPÆDIC OFFICER at the General Infirmary at Leeds. The appointment is graded as Senior House Officer and will be for 1 year in the first instance.

Applications, stating age, sex, nationality, qualifications and previous posts with dates, to be forwarded to the undersigned not later than 28th February, 1953.

S. CLAYTON FRYERS, Secretary to the Board.

The General Infirmary, Leeds.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of SENIOR REGISTRAR in Otolaryngology for duties at the General Infirmary at Leeds, together with 1 session per week at Seacroft Hospital, Leeds.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with names of 3 referees, should be forwarded to the Joint Medical Secretary, Joint Registrars Committee, School of Medicine, Leeds, 2, not later than 7th March, 1953.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of REGISTRAR to the Department of Venereology, in the General Infirmary at Leeds. Previous experience in this specialty desirable. The post offers good opportunity for training in this specialty and prospect of advancement to Senior Registrar status.

Applications, stating age, qualifications, and details of present and previous posts with dates, giving the names of 3 referees, should be forwarded to the Medical Secretary, Joint Registrars Committee, School of Medicine, Leeds, 2, not later than 27th February, 1953.

LEICESTER ROYAL INFIRMARY. Leicester Regional CENTRE FOR RADIOTHERAPY. Applications are invited for the resident post of SENIOR HOUSE OFFICER (radiotherapy) or REGISTRAR if in possession of Part I of the D.M.R.T., now vacant.

Candidates should state age, nationality, qualifications and submit copies of 3 recent testimonials, to Secretary, Leicester No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LEICESTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER (Casualty Department), immediate vacancy. The post gives opportunity for study for Final examination for Fellowship.

Applications, with copies of 3 testimonials, forthwith, to Secretary, Leicester No. 1 Hospital Management Committee, 38A, East Bond-street, Leicester.

LEIGH INFIRMARY, Leigh, Lancs. (102 Beds.) House SURGEON (Male or Female) with some casualty duties, required at the above Hospital. House Officer grade post, recognised for the F.R.C.S. examinations. Post now vacant.

Applications, stating age, qualifications, &c., together with the names of 2 referees, should be received by the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, as early as possible.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics at the above Hospital. The post is resident; terms and conditions of service in accordance with those laid down for hospital medical and dental staffs.

Apply, stating age, qualifications and experience, to the undersigned as soon as possible.

R. W. HOWICK, Group Secretary,
Lincoln No. 1 Hospital Management Committee.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL MATERNITY HOSPITAL. Applications are invited for a temporary post as SENIOR HOUSE OFFICER (obstetrics) for the period 1st April–30th September, 1953.

Apply by 28th February, 1953, on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL MATERNITY HOSPITAL. Applications are invited for a temporary post as SENIOR HOUSE OFFICER (pathology) for the period to 30th September, 1953.

Apply by 7th March, 1953, on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL RADIUM INSTITUTE, Liverpool, 7. Applications are invited for 2 resident posts in the JUNIOR HOSPITAL MEDICAL OFFICER grade. Salary scale £700–£50–£1000 according to experience. These appointments are particularly valuable to practitioners who contemplate adopting radiotherapy as a special career. On the other hand, they provide an excellent opportunity for those studying for a higher qualification either in medicine or in surgery.

Applications, giving particulars of age, and experience, together with names of 2 referees, should reach the Medical Director by 7th March, 1953.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) Applications are invited for the post of HOUSE OFFICER (obstetrics, gynæcology and some other duties) which is now vacant at this busy General Hospital. A deduction of £100 p.a. will be made for residential emoluments.

Applications, giving full particulars, together with names of 2 referees, to be addressed to the Hospital Secretary.

MACCLESFIELD HOSPITAL (West Park Branch). Applications are invited for the post of RESIDENT OBSTETRIC GYNÆCOLOGICAL HOUSE OFFICER, to become vacant 1st April, 1953. The post is recognised for the purpose of training for the D.Obst.R.C.O.G. There are 28 obstetric and 30 gynæcological beds in the Unit.

Applications, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, to be forwarded as soon as possible to the Secretary, Macclesfield and District Hospital Management Committee, Willerby House, Cumberland-street, Macclesfield.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the appointment of HOUSE SURGEON for Accident Service and Casualty. The post will be for 6 months in the first instance, and is now vacant.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, should be sent to the Secretary, immediately.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. Applications are invited for the post of HOUSE SURGEON, vacant now. Preference will be given to persons seeking a pre-registration post under the Medical Act, 1950. Salary on national scale.

Applications, stating age, nationality and qualifications, together with the names of 3 referees, should be sent to the Hospital Secretary.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. Post vacant March, 1953. Salary at the rate of £350 a year; a deduction at the rate of £100 a year is made in respect of board and lodging and other services provided.

Applications should be forwarded as soon as possible to the Administrative Officer at the Hospital.

MALVERN, WORCS. ST. WULSTAN'S HOSPITAL. SOUTH WORCESTERSHIRE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. The post offers good experience in modern treatment of pulmonary tuberculosis and in all forms of major and minor surgery. Some previous experience in the specialty, either surgical or medical, is necessary. National Health Service conditions of service.

Applications to the Physician-Superintendent, St. Wulstan's Hospital.

MANSFIELD (near). NEWSTEAD SANATORIUM, FISHPOOL, near MANSFIELD, NOTTS. (240 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Female). The Sanatorium is a modern building and the post offers good experience in all forms of treatment of pulmonary tuberculosis. The successful applicant will also undertake outpatient work at the Nottingham Chest Clinic, for which free transport is provided; and facilities are available for attending the Thoracic Surgical Clinic.

Apply, giving age, qualifications, and names of 2 referees, to the Physician-Superintendent.

MARKET DRAYTON (near). CHESHIRE JOINT SANATORIUM. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER for duties at Stanfield Sanatorium, Stoke-on-Trent (91 Beds).

Applications, stating age, nationality, and full details of previous experience, together with copy testimonials, to the Medical Superintendent.

MERTHYR GENERAL HOSPITAL. (120 Beds.) Merthyr AND ABERDARE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SURGICAL OFFICER. The post offers a very good all-round experience in general surgery. Salary £670 p.a., less £100 p.a. for board, lodging, &c. Applicants must have been registered not less than 1 year as a medical practitioner and have previously held house appointments. Appointment for 1 year in the first instance.

Applications, with names of 2 referees, to the Secretary, Merthyr and Aberdare Hospital Management Committee, St. Tydfil's Hospital, Merthyr Tydfil, as soon as possible.

MONTROSE. ANGUS. ROYAL MENTAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (Male or Female). Previous psychiatric experience unnecessary. A well-equipped Pathological and Biological Laboratory is available. Salary £670 p.a., with deductions of £150 p.a. for board, lodging, &c.

Applications, with the names of 2 referees, should be sent to the Physician-Superintendent.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following posts which are now vacant:—

Park Hospital, Davyhulme (General Hospital—426 Beds)
SENIOR HOUSE OFFICER (non-tuberculous thoracic surgery) for Manchester Regional Hospital Board Centre.
HOUSE OFFICER (general surgery) with some duties in E.N.T. work.

Vacancies occur periodically in the various departments at Park Hospital and House Officers are eligible for appointment to another specialty at the end of the original term of service when such vacancies occur.

Eccles and Patricroft Hospital (General Hospital—72 Beds)
HOUSE OFFICER.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Salaries for House Officer posts £350–£450 p.a., according to experience, plus £50 p.a. for the post at Eccles and Patricroft Hospital. £100 p.a. deduction for residential accommodation and services. 6 months appointments.

The Senior House Officer appointment will be for 12 months at a salary of £670 p.a., less £155 p.a. for residential accommodation and services.

Application forms from the Secretary, Park Hospital, Davyhulme, Manchester.

MANCHESTER REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (pulmonary tuberculosis), resident, Monsall Hospital, Newton Heath, Manchester, 10, for 80 T.B. Beds (Male and Female). Experience of treatment of pulmonary T.B. essential. Salary scale £775–£890, less £155 for residence.

Applications, with names of 3 referees, to be sent to Group Secretary, Booth Hall Hospital, Manchester, 9, as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the non-resident post of REGISTRAR in General Medicine, to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool.

Applications, together with copies of 2 recent testimonials, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of NON-RESIDENT SENIOR REGISTRAR in Psychiatry, with inpatient and outpatient duties in the Psychiatric Department of Crumpsall (General) Hospital, Manchester (1200 Beds), and inpatient duties at the adjacent Springfield (Mental) Hospital, Manchester (800 Beds). This post provides excellent training in all branches of psychiatry. Springfield Hospital is associated with the University Department of Psychiatry and arrangements can be made in due course for the appointee to gain experience in child psychiatry. Previous experience and a higher qualification desirable.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with the names of 3 referees, to be received by 4th March, 1953.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, MANCHESTER, 8. (Non-Sectarian; General Hospital—105 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER (surgery), now vacant, to act as Deputy Resident Surgical Officer.

Applications, stating age, qualifications and dates, particulars of previous appointments with dates, along with the names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (orthopædics) shortly vacant, with duties at Crumpsall Hospital and other hospitals within the Group.

Applications, stating age, qualifications and dates, particulars of previous appointments with dates, along with the names and addresses of 2 referees, to be sent to the undersigned immediately.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (obstetrics and gynæcology). The Hospital takes part in undergraduate medical teaching, and the post is recognised in obstetrics and gynæcology for M.R.C.O.G. purposes.

Application forms should be obtained from the undersigned and returned within 14 days of the appearance of this advertisement.

A. H. KEATES, Secretary to the Committee.

Withington Hospital, Manchester, 20.

NEWCASTLE. ST. NICHOLAS MENTAL HOSPITAL, GOSFORTH, NEWCASTLE UPON TYNE, 3. Required, SENIOR HOUSE OFFICER (resident). The Mental Hospital (1150 Beds) and the Mental Deficiency Hospital (65 Beds) carry out all forms of modern treatment. Opportunity will be given for study of psychoneurosis, delinquency and child psychiatry, inpatient and outpatient. Time will be allowed to attend the course at the Professorial Department of Psychological Medicine, King's College, for the Diploma of Psychological Medicine. Salary of £670 p.a., less £150 p.a. for residential amenities. This post is subject to the terms and conditions of service for hospital medical staff and the superannuation regulations. A medical examination will be required.

Applications, stating age, nationality, experience, and qualifications, and providing the names of 3 referees, should reach the Physician-Superintendent, within 2 weeks of the appearance of this advertisement.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the non-resident appointment of SURGICAL REGISTRAR to the Ophthalmic Department of the Royal Victoria Infirmary. The post will offer scope to prepare for a higher degree. The appointment is for 1 year in the first instance and will be subject to Ministry of Health terms and conditions of service for hospital medical and dental staffs in the National Health Service.

Applications, giving age, nationality, experience and qualifications, with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the date of appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the appointment of Whole-time NON-RESIDENT SENIOR REGISTRAR in Obstetrics and Gynæcology at the Royal Victoria Infirmary and the Princess Mary Maternity Hospital. The appointment will be subject to Ministry of Health terms and conditions of service for hospital medical and dental staffs in the National Health Service.

Applications, giving age, nationality, experience, and qualifications, with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the date of appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of REGISTRAR in the Department of Radiotherapy. The possession of the D.M.R. or D.M.R.T. is an advantage but not essential for this appointment.

Applications, giving age, nationality, experience and qualifications, with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the date of appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the non-resident appointment of Whole-time REGISTRAR in the Orthopædic Department at the Royal Victoria Infirmary. The successful candidate will be required to teach in his subject, and preference will be given to applicants who have passed the Primary Fellowship examination.

Applications, giving full particulars, with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE REGIONAL HOSPITAL BOARD. Cumberland Infirmary, Carlisle, &c. (350 Beds.) REGISTRAR ANÆSTHETIST (whole-time) resident, or non-resident near main hospital, up to 31st August, 1954, in the first instance. Salary £775–£890.

Applications, with names and addresses of referees (preferably), or testimonials to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Newcastle General Hospital. (860 Beds.) REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time), required up to 31st August, 1954, in the first instance, and may be renewed for a further year. This is a combined appointment between Hexham (Dilston Hall Maternity Home—55 Beds) and Newcastle (100 obstetrical and gynæcological beds) with probably at least 6 months in each area. The General Hospital is a Teaching Unit. Single accommodation might be available in Newcastle.

Applications, together with names and addresses of referees (preferably), or testimonials to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Tees-side Hospital Management Committee Group. Stockton and Thornaby Hospital. (135 Beds.) SURGICAL REGISTRAR (whole-time), resident or non-resident. Salary £775–£890. Appointment up to 31st August, 1954, in the first instance.

Applications, together with names and addresses of referees (preferably), or testimonials to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Royal Infirmary Sunderland. (300 Beds.) SURGICAL REGISTRAR to act as Resident Surgical Officer (106 surgical beds). Salary £775–£890. The post is recognised for the F.R.C.S. examination, and will be tenable up to 31st August, 1954, in the first instance. Single accommodation available.

Applications, together with names and addresses of referees (preferably), or testimonials to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Wooley Sanatorium; Hexham Chest Clinic. Applications are invited for the appointment of SENIOR REGISTRAR. The duties will be largely in the Sanatorium and in associated beds in the Hexham General Hospital, and in the Hexham Chest Clinic. Appointment up to 31st August, 1954, in the first instance. Salary £1000–£1300 p.a. The appointment offers opportunities for experience in all forms of sanatorium treatment, some major chest surgery and chest clinic work. Accommodation for a married man is available at the Sanatorium. Further details can be obtained from the Medical Superintendent.

Applications, together with names and addresses of referees (preferably), or testimonials to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWPORT, I.W. ST. MARY'S HOSPITAL. (365 Beds.) HOUSE SURGEON, vacant now. Recognised pre-registration post. National salary scale and conditions.

Applications, giving full details, with copies of 2 testimonials, to Chief Administrative Officer, Hospital Management Committee, Clatterford House, Carisbrooke, I.W.

NORWICH. UNITED NORWICH HOSPITALS. East ANGLIAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Duties mainly at Norfolk and Norwich Hospital, but also at Jenny Lind Hospital for Children. Post provides wide experience and recognised for D.A. Single quarters available. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, details of present and previous appointments, together with the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 9th March, 1953. Candidates invited to visit hospitals by direct arrangement with the Hospital Management Committee Secretary at the Norfolk and Norwich Hospital.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Applications are invited for the appointment of JUNIOR CASUALTY OFFICER AND HOUSE SURGEON to the E.N.T. and Ophthalmic Departments (House Officer status). 6 months appointment. Salary £350, £400 or £450 according to experience, less deduction £100 p.a. for residence, &c.

Applications, stating age, experience, qualifications, with names of 2 referees, to the Secretary, Norwich, Lowestoft, and Great Yarmouth Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Applications are invited for the appointment of HOUSE SURGEON to the Orthopædic Department. Salary £350–£450 according to experience, less £100 p.a. for residence, &c. 6 months appointment.

Applications, stating age, qualifications, experience, with names of 2 referees, to Secretary, Group 6 Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Applications are invited for the post of HOUSE SURGEON (Male or Female) at the West Norwich Hospital, Bowthorpe-road, Norwich. Recognised for Final F.R.C.S. examination requirements. The beds at this Hospital are under the control of the Consultant staff of the Norfolk and Norwich Hospital. Salary £350, £400 or £450 according to experience ; deduction for residence.

Applications, stating age, qualifications and experience, with names of 2 referees, to Secretary, Group 6 Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. NORFOLK AND NORWICH HOSPITAL. PÆDIATRIC DEPARTMENT AT THE JENNY LIND HOSPITAL FOR CHILDREN. Applications are invited for the appointment of HOUSE SURGEON (Male or Female) in the Surgical Section of the Jenny Lind Hospital, which forms the entire Pædiatric Department of the United Norwich Hospitals. The post is recognised under the Medical Act, 1950, for pre-registration service. The duties are under the direct supervision of the Consultant staff of the Norfolk and Norwich Hospital. Salary £350, £400 or £450, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications and experience, with names of 2 referees, to Secretary, Norwich, Lowestoft and Gt. Yarmouth (Group 6) Hospital Management Committee, St. Stephen's-road, Norwich.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of E.N.T. SENIOR HOUSE OFFICER, commencing 1st April, 1953. Recognised for F.R.C.S. and D.L.O. 6 months appointment in first instance. Deduction £100 a year for residential emoluments.

Applications, enclosing copies of 3 recent testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of HOUSE SURGEON (general surgery), commencing 1st April, 1953. 6 months appointment in first instance. Recognised for F.R.C.S. and for pre-registration.

Applications, enclosing copies of 3 recent testimonials as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Casualty Department), commencing 1st April, 1953. 6 months appointment in first instance. Deduction £100 a year for residential emoluments.

Applications, enclosing copies of 3 recent testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Anæsthetic Department), commencing 1st April, 1953. Recognised for D.A. 6 months appointment in first instance. Deduction £100 a year for residential emoluments.

Applications, enclosing copies of 3 recent testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of ANÆSTHETIC HOUSE OFFICER commencing 1st April, 1953. 6 months appointment in first instance. Recognised for D.A. and for pre-registration.

Applications, enclosing copies of 3 recent testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of PÆDIATRICS HOUSE OFFICER, commencing 1st April, 1953. Post recognised for D.C.H. and for pre-registration. Person appointed will be required to reside alternately, with another Pædiatrics House Officer, for 3 months at Northampton General and Harborough Road, Hospitals, Northampton, and whilst at the latter Hospital, to be responsible to the Consultants for the supervision of all the beds, allocated as follows : subacute pædiatric 20, dermatological 16, general medical 24, infectious diseases 52 (mostly children, but including polio). 6 months appointment in first instance.

Applications, enclosing copies of 3 recent testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of HOUSE OFFICER to Fracture and Orthopædic Department, commencing 1st April, 1953. Recognised for F.R.C.S. and for pre-registration. 6 months appointment in first instance.

Applications, enclosing copies of 3 recent testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (487 Beds.) Applications invited for post of HOUSE PHYSICIAN commencing 1st April, 1953. 6 months appointment in first instance. Recognised for pre-registration.

Applications, enclosing copies of 3 recent testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. Required, GROUP SENIOR HOUSE OFFICER (Anæsthetist) non-resident, to commence duties as soon as possible. Salary £670 p.a. Post recognised for D.A. qualification. This appointment in busy hospitals staffed by Manchester Consultants offers excellent opportunities of practical experience to suitably qualified candidates. The work will be principally at Altrincham General Hospital (130 Beds), and St. Anne's E.N.T. Hospital (53 Beds), but successful candidate will be expected to work at any other hospital in the Group.

Forms of application may be obtained from the Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham, Cheshire, and should be returned with copies of 2 recent testimonials.

NOTTINGHAM. CITY HOSPITAL. (821 Beds.) Required, HOUSE SURGEON, post vacant 2nd April, 1953 (recognised for pre-registration purposes). Salary £350–£450 p.a., according to experience.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (821 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Thoracic Surgery. Post vacant 15th March, 1953. Salary £670 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners (Male or Female) for the post of RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER ; duties to commence on or about 1st March, 1953. Terms and conditions of service in accordance with the published regulations of the Ministry of Health. £150 deducted for residential emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the undersigned as soon as possible. HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER for the Casualty Department. Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry ; duties to commence as soon as possible.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. Resident House SURGEON required (Male or Female) for the above Hospital. Duties to commence on or about 12th March, 1953. Salary and conditions of service in accordance with published regulations. If held by R Practitioners the appointment will be for a period of 6 months.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

OLDHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. OLDHAM ROYAL INFIRMARY. (200 Beds.) Appointment of RESIDENT CLINICAL PATHOLOGIST (grade—Senior House Officer). Applications are invited for the above appointment in the Department of Pathology in the Oldham and District Group of hospitals, vacant immediately. The duties will consist mainly of clinical pathology, but include P.H. bacteriology and V.D. serology ; also general and emergency work, and supervision of the blood banks. Previous experience in pathology is not essential. Salary will be £670 p.a., less the appropriate charge for residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, and quoting Ref. No. B/17, should be forwarded immediately to the Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale-road, Oldham.

OLDHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR ANÆSTHETIC HOUSE OFFICER (resident) for duties at the Oldham Royal Infirmary (200 Beds) and the Boundary Park General Hospital (390 Beds), vacant immediately. The hospitals are recognised for the D.A. Salary in accordance with the terms and conditions of service of hospital medical staff.

Applications, giving age, sex, nationality, qualifications and previous appointments, together with the names of 3 persons to whom reference may be made if desired should be sent forthwith to the Secretary. Please quote Ref. No. B/15.

F. W. BARNETT, Group Secretary.

Central Offices, Rochdale-road, Oldham.

OLDHAM. WESTHULME INFECTIOUS DISEASES HOSPITAL. (85 Beds.) OLDHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER (status Senior House Officer), becoming vacant at the end of February, 1953. The post also carries duties in the Medical and Pædiatric Departments of the 2 acute general hospitals in the Group. Salary in accordance with the terms and conditions of service of hospital medical staff.

Applications, giving details of qualifications and experience, together with copies of 2 recent testimonials, and quoting Ref. No. B/14, should be forwarded to the undersigned immediately. F. W. BARNETT, Group Secretary.

Central Offices, Rochdale-road, Oldham.

OXFORD. WARNEFORD AND PARK HOSPITALS. SENIOR HOUSE OFFICER required. Warneford Hospital (140 Beds) is developing as an Acute Psychiatric Unit, specially related to research and postgraduate teaching. The adjacent Park Hospital is a Neurosis Centre (30 Beds) with daily outpatient clinics. Previous psychiatric experience not essential. This post is specially suitable for training for D.P.M., for which full facilities are available, including neurology and child psychiatry. Accommodation is available for single man or woman.

Further particulars may be obtained from the Physician-Superintendent, Warneford Hospital, Oxford, to whom applications should be sent, with the names of 2 referees, within 14 days.

PAISLEY AND DISTRICT HOSPITALS BOARD OF MANAGEMENT. The undernoted House Officer posts are now vacant.

(1) HOUSE PHYSICIAN for Infectious Diseases Unit at Paisley I. D. Hospital. The work includes tuberculosis and thoracic surgery.

(2) HOUSE PHYSICIAN for Royal Alexandra Infirmary Annexe. The work includes chronic medicine, general and minor surgery.

Applications should be submitted, as early as possible, to the Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of REGISTRAR in Anæsthetics. The appointment will be for 1 year and eligible for extension to a second year. The successful applicant may be required to be resident for a maximum of 3 months during appointment.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 7th March.

PENZANCE. WEST CORNWALL HOSPITAL. (General—100 Beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of CASUALTY HOUSE SURGEON. Post now vacant.

Applications, stating age, nationality, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be forwarded to the Hospital Secretary, West Cornwall Hospital, Penzance.

PETERBOROUGH MEMORIAL HOSPITAL. East ANGLIAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR. Duties primarily to be in immediate charge of busy Casualty Department but successful candidate will share other surgical duties. Post provides wide experience in casualty and general surgery. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 9th March, 1953. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) SENIOR HOUSE OFFICER to the E.N.T. Department of the Plymouth Hospitals, vacant immediately.

(2) SENIOR HOUSE OFFICER in Surgery, Greenbank Road Section, vacant 13th March, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(3) RESIDENT ANÆSTHETIST, Greenbank Road Section, vacant immediately, recognised for the D.A.

(4) HOUSE SURGEONS, Greenbank Road Section, vacancies 13th March, 8th and 20th April, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(5) SENIOR HOUSE OFFICER in Anæsthetics, Freedom Fields Section, vacant immediately.

(6) HOUSE SURGEON, Freedom Fields Section, vacant 22nd February, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(7) HOUSE SURGEON in Obstetrics and Gynæcology, Alexandra Maternity Home, Devonport, vacant 14th May, 1953.

Applications, stating age, nationality, qualifications and experience with the names of 3 referees, to be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Devonport.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank Road. Applications invited from duly qualified and registered medical practitioners for the appointment of SENIOR HOUSE OFFICER to Casualty and Fracture Department, vacant 1st March, 1953. The appointment will be for a period of 12 months. Salary at £670 p.a.

Applications, stating age, nationality, qualifications, and experience, together with the names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Devonport.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY. Applications invited from registered medical practitioners for the appointments of :—

(1) HOUSE SURGEON (second or third post), vacant 1st May, 1953.

(2) HOUSE SURGEON (second or third post), vacant 14th May, 1953.

Recognised for the Membership of the Royal College of Obstetricians and Gynæcologists. Wide experience can be obtained in obstetrics, including antenatal and postnatal clinics.

Applications, stating age, nationality, qualifications and experience, together with 3 recent testimonials, should be sent to ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Devonport.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT OBSTETRICAL OFFICER (Senior House Officer grade), vacant 1st April, 1953. There will be additional duties at the Flete Maternity Home and the Alexandra Maternity Home, which are parts of the Department. Candidates should have had considerable experience in a department of obstetrics and gynæcology. The appointment will be for a period of 12 months and is renewable. Salary £670 p.a. Terms and conditions of service are in accordance with the National Health Service terms. The post is recognised by the Royal College of Obstetricians and Gynæcologists for the Membership examination of the College.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, should be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.

7, Nelson-gardens, Devonport.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SAINT MARY'S HOSPITAL. (773 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER (Casualty and Orthopædic Department).

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Saint Mary's Hospital (74 acute medical beds)
HOUSE PHYSICIAN, vacant 1st March, 1953.
Queen Alexandra Hospital (124 surgical beds)
HOUSE SURGEON, vacant 15th March, 1953.

Applications, stating age, experience and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Royal Portsmouth Hospital (70 surgical beds)
HOUSE SURGEON, vacant now.
Chest Services (160 Beds)
HOUSE PHYSICIAN, vacant now.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

POTTERS BAR AND DISTRICT HOSPITAL, Mutton-lane, POTTERS BAR, MIDDLESEX. (57 Beds.) Locum RESIDENT HOUSE OFFICER required 30th March–12th April inclusive.

Applications, with 2 recent testimonials, to be sent to Group Secretary, 1, Wellhouse-lane, Barnet, Herts.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds. Committee's Base Hospital serving population of 177,000. Recognised for the D.Obst.R.C.O.G., D.C.H., and D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical).

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

POOLE GENERAL HOSPITAL, Poole, Dorset. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required immediately. The Hospital is recognised for the F.R.C.S. and F.R.C.S.E.

Applications to the Hospital Secretary of the Hospital.

READING COMBINED HOSPITALS. Applications are invited for the posts of :—

HOUSE SURGEON (gynæcology) Royal Berkshire Hospital, vacant 16th March.

HOUSE SURGEON (obstetrics) Battle Hospital, vacant 1st April.

Both for period of 6 months. M.R.C.O.G. recognised.

Applications, with full particulars, and copies of 3 recent testimonials, to the Secretary, Royal Berkshire Hospital, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited for the appointment of RESIDENT ASSISTANT PATHOLOGIST (House Officer), vacant 15th April, for period of 6 months. Previous experience in pathology not essential.

Applications, stating age, qualifications with dates, nationality, present post, together with copies of 3 recent testimonials, to the Hospital Secretary.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.

Caerphilly District Miners Hospital, near Cardiff (140 Beds for acute general surgery, orthopædics, E.N.T. ophthalmology, gynæcology ; 30 Beds for general medicine ; busy Outpatient and Casualty Departments ; staffed by full-time and visiting consultants)
SENIOR HOUSE OFFICER.
HOUSE SURGEON.

Tredegar General Hospital, Tredegar, near Newport, Mon. (Surgical Unit of 50 Beds and 6 orthopædic beds under daily supervision of General Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient and Casualty Departments)
SENIOR HOUSE OFFICER.
HOUSE SURGEON.

St. James Hospital, Tredegar, near Newport, Mon. (42 obstetric beds, Medical Unit of 38 Beds and a Geriatric Unit of 78 Beds ; medical establishment Visiting Physician, Geriatrician, and Obstetrician, together with Resident Senior House Officer and House Officer)
HOUSE PHYSICIAN.

The House Officer posts are approved for pre-registration under the Medical Act, 1950 ; salary is £350 p.a. and tenure 6 months. The Senior House Officer posts at £670, less an agreed deduction for full residential emoluments, are tenable for 12 months.

Apply, with full particulars, and names of 2 referees, to the Group Secretary, District Miners Hospital, Caerphilly, near Cardiff.

RHONDDA. PORTH AND DISTRICT HOSPITAL. (110 Beds. This Hospital is visited regularly by Consultants from the Cardiff Royal Infirmary.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (surgical and casualty).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (247 Beds.) Applications are invited from registered medical practitioners (Male) for the post of RESIDENT HOUSE OFFICER (general surgery) at the above Hospital. 6 months appointment. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be addressed immediately to the Medical Superintendent.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (resident) in the General Surgical Unit vacant from 1st March, 1953. 6 months appointment. This very active General Surgical Unit of approximately 100 Beds affords ample opportunity for candidates to obtain first-class tuition and experience. Appointment recognised for F.R.C.S. examination.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN (neurosurgery), vacant from 25th February, 1953. Resident post, tenable for 6 months. Would be suitable for candidate seeking a higher qualification as it offers excellent experience in neurology.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (81 Beds.) Applications are invited from registered medical practitioners (Male) for the post of RESIDENT HOUSE SURGEON, vacant from 6th March, 1953. 6 months appointment.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology). Applications are invited for the above appointment, tenable for a period of 1 year, and vacant on 1st March, 1953. The post is recognised for the M.R.C.O.G. The Hospital has a Maternity Unit of 70 Beds, a Gynæcological Ward of 25 Beds and a Premature Baby Unit of 8 Cots. Salary £670 p.a. less the appropriate charge for residential emoluments; married accommodation may be available in due course. Previous experience in obstetrics and gynæcology is essential.

Applications, stating age, qualifications with dates, nationality, previous experience, accompanied by copies of 3 recent testimonials, should be sent to the undersigned not later than 7th March, 1953. J. C. FIELD, Secretary.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER to the E.N.T. Department. The Department has 42 Beds and is recognised for the D.L.O. and F.R.C.S. Post vacant 1st March, 1953.

Apply, as soon as possible, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SCARBOROUGH HOSPITAL. (190 Beds.) Scarborough, BRIDLINGTON, MALTON AND WHITBY GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, SENIOR HOUSE OFFICER (surgical), to commence duty approximately mid-May. Terms and conditions of service in accordance with those prescribed for medical and dental staffs. The post which is recognised by the Royal College of Surgeons for the F.R.C.S., will be for a period of 1 year. The position will be non-resident and a flat is available near to the Hospital if required.

Applications, giving age, qualifications, details of present and previous appointments with dates, and the names of 3 referees, should be forwarded to the Secretary of the Hospital, Scalby-road, Scarborough.

SHOTTS. HARTWOOD MENTAL HOSPITAL. Applications are invited for: (*a*) JUNIOR HOSPITAL MEDICAL OFFICER; (*b*) HOUSE OFFICERS. Salaries and conditions of service as prescribed by the Department of Health for Scotland for hospital medical staff.

Applications, stating age and qualifications, &c., with names of 3 referees, to the Medical Superintendent, Hartwood Mental Hospital, Shotts, Lanarkshire.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL/ROYAL INFIRMARY UNITS. Applications are invited for the non-resident post of REGISTRAR in the Department of Radiology at the above hospitals. The successful applicant will be required to undertake the course of instruction for a Diploma in Diagnostic Radiology provided by the University of Sheffield.

Applications, stating age, qualifications, and experience, with the names of 3 referees, should be sent immediately to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL INFIRMARY UNIT. Applications are invited for the non-resident post of SENIOR REGISTRAR in Neurosurgery at the above Hospital.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent by 14th March, 1953, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD CHEST SERVICE. Sheffield Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the resident whole-time post of REGISTRAR (chest diseases), for the above Service, with duties mainly at the Crimicar Lane Sanatorium, Sheffield. The appointment is for 1 year in the first instance and may be renewed for a further year.

Applications, giving age, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to arrive not later than 9th March, 1953.

SHEFFIELD. CITY GENERAL HOSPITAL. Group LABORATORY. Applications are invited for the post of SENIOR HOUSE OFFICER in Clinical Pathology. Facilities for all round training in all branches of pathology.

Apply, giving full details of age, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, to the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Secretary,
Sheffield No. 1 Hospital Management Committee.

SHEFFIELD. CITY GENERAL HOSPITAL. Applications are invited for the resident post of SENIOR HOUSE OFFICER in Orthopædics. Salary £670, less charge of £130 p.a. for board and lodging.

Apply, giving full details of age, qualifications, &c., present and previous appointments with dates, and the names of 2 persons for reference, to— W. STANSFIELD, Secretary,
Sheffield No. 1 Hospital Management Committee.
Nether Edge Hospital, Sheffield, 11.

SHEFFIELD, 6. MIDDLEWOOD HOSPITAL. (2000 Beds.) SHEFFIELD NO. 2 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male or Female Officers for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at Middlewood Mental Hospital. Living quarters and residential services are available for single officers. Remuneration will be in accordance with the terms and conditions of service issued by the Ministry of Health. There are good facilities for post-graduate study for the D.P.M. and there is full collaboration with the general hospital situate in the same grounds. Excellent laboratory and other special departments. Extensive psychiatric outpatient service.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be forwarded immediately to the Medical Superintendent, Middlewood Hospital, Sheffield, 6. R. BRADLEY, Group Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP 15 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from general registered practitioners (Male or Female) for the appointment of 2 RESIDENT HOUSE SURGEONS in General Surgery. 1 vacant immediately; 1 vacant 1st March, 1953, and both tenable in the first instance for 6 months. Recognised for the F.R.C.S., and both posts approved for pre-registration service. Salary and conditions of service in accordance with national scale.

Applications, with references, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury. J. P. MALLETT, Group Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade), vacant 31st March, 1953. Post recognised for the D.A.

Applications, stating age, nationality, qualifications, and previous hospital appointments, together with copies of recent testimonials, should be sent to the Group Secretary, Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Group Secretary.
Royal Salop Infirmary, Shrewsbury, 13th February, 1953.

SLOUGH, BUCKS. UPTON HOSPITAL. North West METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT SURGICAL REGISTRAR required at above Hospital. Post recognised for Final F.R.C.S. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Windsor Group Hospital Management Committee, Kipling Memorial Building, Alma-road, Windsor, by 2nd March, 1953.

SLOUGH, BUCKS. UPTON HOSPITAL. Locum SURGICAL REGISTRAR required from 3rd March. Resident post; salary on national scale.

Applications stating age, qualifications and experience, should be sent to the Hospital Secretary.

SOUTHAMPTON CHEST HOSPITAL. Resident House OFFICER (Male or Female) required from 26th March for duties partly in the wards for infectious diseases, partly in the Chest Department. Post tenable for 6 months.

Apply as soon as possible with copies of testimonials to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds—Recognised for F.R.C.S.) HOUSE SURGEON (resident) required immediately. Post tenable 6 months.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (280 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post tenable 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON (House Officer grade) now vacant, for a period of 6 months for general surgical duties, including certain duties in the Orthopædic and Fracture Department.

Applications, stating age, qualifications and experience, with copies of 3 recent testimonials, to reach the undersigned as soon as possible. J. C. FIELD, Secretary,
Southend-on-Sea Hospital Management Committee.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for the position of RESIDENT SENIOR HOUSE OFFICER (medical) for 1 year from 1st April, 1953, for duties in a modern general hospital with a large Outpatient Department.

Applications, stating age, qualifications, nationality, and previous experience, with copies of recent testimonials, should reach the undersigned not later than 25th February, 1953.

J. C. FIELD, Secretary.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST vacant on 1st April, 1953 (Senior House Officer). Salary £670 p.a. subject to the appropriate deductions for board. Appointment for 6 months at the General Hospital, Southend, followed by 6 months at the General Hospital, Rochford, and 6 months at hospitals in the Group generally. This combined appointment has been recognised as fulfilling the conditions of the D.A.

Applications, &c., should reach the undersigned at the hospital by 25th February, 1953. J. C. FIELD, Secretary.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædics in the Royal Infirmary of Edinburgh, as from 1st April, 1953. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, previous experience and qualifications, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Ophthalmology at the Royal Infirmary of Edinburgh, as from 5th June, 1953. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, previous experience, and qualifications, together with the names of 2 referees should be submitted to the Secretary, South-Eastern Regional Hospital Board, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for 2 appointments of SENIOR REGISTRAR in Medicine, 1 at the Royal Infirmary of Edinburgh and 1 in the Edinburgh Northern Group of hospitals, as from 5th July, 1953. The posts are superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, previous experience, and qualifications, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in E.N.T. Surgery in the Edinburgh Northern Group of hospitals, as from 5th June, 1953. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, previous experience, and qualifications, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Dermatology on the staffs of the Aberdeen General Hospitals and Aberdeen Special Hospitals. Salary and terms and conditions of appointment are as laid down for hospital medical and dental staffs (Scotland).

Applications, together with the names of 2 referees, should be lodged by 7th March, 1953, with the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars of the appointment can be obtained.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Anæsthetics on the staffs of the Aberdeen Hospitals. Candidates preferably should hold a higher qualification in anæsthetics. Salary is within the scale of £1000–£1300 p.a. Terms and conditions are as laid down for hospital medical and dental staffs (Scotland).

Applications, together with the names of 2 referees, should be lodged by 7th March, 1953, with the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. DUNDEE TEACHING HOSPITALS. Applications are invited for an appointment as REGISTRAR in Cardiology in the Units of the Professor of Medicine in the Dundee Teaching Hospitals (Dundee Royal Infirmary—550 Beds, and Maryfield Hospital —400 Beds). Candidates should have had experience in general medicine and some experience and training in a modern cardiac clinic. M.R.C.P. qualification desirable. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, "Braeknowe," 430, Blackness-road, Dundee, with whom applications must be lodged not later than 9th March, 1953.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (159 Beds—Recovery Unit 32 Beds.) **STAFFORD HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the post of HOUSE SURGEON (Male or Female), vacant 15th March. Post recognised for training for F.R.C.S. Eng., and for pre-registration service.

Applications, giving full particulars, together with copies of 3 recent testimonials, should be forwarded to—

H. H. JONES, Group Secretary.

13, Foregate-street, Stafford.

STAFFORD. STANDON HALL ORTHOPÆDIC HOSPITAL, near ECCLESHALL, STAFFORD. Applications are invited from suitably qualified medical practitioners (Male or Female) for the post of SENIOR HOUSE OFFICER (orthopædics). Salary £670 p.a., less deduction for residential emoluments.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should be forwarded to— H. H. JONES, Group Secretary,

Stafford Hospital Management Committee.

13, Foregate-street, Stafford.

ST. ALBANS (near). HARPERBURY HOSPITAL FOR MENTAL DEFECTIVES, Harper-lane, SHENLEY, near ST. ALBANS, HERTS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. 2 REGISTRARS required at above Hospital. Experience in psychiatry necessary and preference given to candidates possessing the D.P.M. or its first part. There are 1500 patients of all grades and ages in this modern hospital. Unfurnished house available for a married man and furnished accommodation for single man at a reasonable rental.

Application forms obtainable from, and returnable to, the Secretary of the Hospital Management Committee, at the above address by 3rd March, 1953.

ST. ALBANS CITY HOSPITAL. (372 Beds.) Applications are invited for the appointment of HOUSE SURGEON (House Officer grade) for 1 of the 2 general surgical teams. (Recognised for the F.R.C.S.) Post vacant 26th March, 1953. Preference will be given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications, together with the names of 2 referees, should be forwarded to the Deputy Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, Herts.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of SENIOR HOUSE OFFICER (surgical). 2 posts are available if no applicants are forthcoming for pre-registration appointments. The posts are recognised for F.R.C.S. examination.

Applications, giving details of previous appointments held, together with copies of recent testimonials, should be forwarded forthwith to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of HOUSE SURGEON (pre-registration), 3 posts. Vacant now.

Applications, with copy testimonials, to be forwarded to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (general surgery), vacant 1st March 1953. The Hospital is recognised for F.R.C.S. examination and the post is recognised for experience during pre-registration period.

Apply, with copy testimonials, stating age, nationality, and full details of previous services, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFS ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (gynæcology), vacant 31st March, 1953. The post is recognised for pre-registration experience and also for the M.R.C.O.G. (Gynæcology only) examination.

Applications, with copy testimonials, and details of previous service, &c., to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SWINDON HOSPITAL GROUP. (536 Beds.) **Swindon AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** Applications invited from registered medical practitioners for the post of RESIDENT HOUSE SURGEON for General Surgical Unit (80 Beds). Post recognised by Royal College of Surgeons under paragraph 23 of the Fellowship regulations for 6 months of requisite years surgical training.

Applications, giving full details, and names of not more than 3 referees, to Secretary, Swindon and District Hospital Management Committee, 7, Okus-road, Swindon, as soon as possible.

SULLY HOSPITAL, Sully, Glam. Major Thoracic Centre. (324 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER required immediately. Experience gained in medical and surgical treatment of all chest diseases in adults and children.

Applications to Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment at the Brighton and Lewes Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 7th March, 1953.

ST. HELENS HOSPITAL, Marshalls Cross-road, St. HELENS. (196 Beds.) Applications are invited for the appointment of RESIDENT HOUSE SURGEON. 6 months appointment. Salary in accordance with the terms and conditions of service for medical staff.

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded to the undersigned as soon as possible.

N. RICHARDS, Secretary,

St. Helens and District Hospital Management Committee, Group Office, County Hospital, Whiston, near Prescot, Lancs.

STOCKPORT. STEPPING HILL HOSPITAL. (464 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Assistant Resident Surgical Officer). The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be forwarded to the undersigned immediately.

H. G. PRICE, Secretary,
Stockport and Buxton Hospital Management Committee.
59B, Shaw-heath, Stockport, Cheshire.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the immediate vacancy of SENIOR HOUSE OFFICER (Resident Surgical Officer). The post is recognised for the F.R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the undersigned, forthwith.

H. G. PRICE, Secretary,
Stockport and Buxton Hospital Management Committee.
59B, Shaw-heath, Stockport, Cheshire.

STONEHOUSE, GLOS. STANDISH HOUSE SANATORIUM. (278 Beds—Tuberculosis.) JUNIOR HOUSE OFFICER required. Post now vacant.

Applications, stating age, nationality and previous hospital appointments, if any, together with the names of 2 referees, to be sent to the undersigned as soon as possible.

A. BRINSFORD, Secretary.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the non-resident appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department of Swansea Hospital. The post is recognised for the F.R.C.S. (Eng.), and D.O. examination.

Applications, stating age, qualifications and experience, should be addressed to—

O. C. HOWELLS, Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

STORNOWAY. LEWIS HOSPITAL. Lews and Harris HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN at the above Hospital, which falls vacant on 1st April, 1953. Salary £400–£500 p.a., according to previous experience. Preference will be given to applicants with previous hospital service. The post is superannuable and will be for a period of 6 months in the first instance.

Applications, together with copies of recent testimonials, should be sent immediately to—

IAN MACLEOD, Secretary and Finance Officer.
Lewis Hospital, Stornoway.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN to the Special Unit for Research in Juvenile Rheumatism required for post vacant 24th April. The post offers scope for those interested in research, pædiatrics, rheumatology or cardiology and previous experience in one of these is desirable. Salary on national scale.

Applications, stating age, qualifications and experience with dates, together with copies of 2 testimonials, should be sent to the Hospital Secretary by 6th March, 1953.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of HOUSE SURGEON (general surgery). Post recognised for F.R.C.S.

Applications, stating age, qualifications with dates, and nationality, together with 2 recent testimonials, should be sent immediately to the Secretary, Musgrove Park Hospital, Taunton.

THORNTON HEATH, SURREY. MAYDAY HOSPITAL. (637 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of SURGICAL REGISTRAR (whole-time), commencing March. Candidates should have good medical and surgical background, and possession of higher surgical qualification an advantage. There are 2 surgical teams at Hospital. Post recognised for F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned by not later than 3rd March.

TRURO. ROYAL CORNWALL INFIRMARY. (212 Beds —8 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the combined pre-registration post of JUNIOR HOUSE PHYSICIAN AND HOUSE SURGEON (E.N.T. and Ophthalmic Departments).

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, to the Hospital Secretary.

TUNBRIDGE WELLS GROUP HOSPITAL MANAGE- MENT COMMITTEE. PEMBURY HOSPITAL, PEMBURY. (624 Beds.) Applications invited for post of RESIDENT ANÆSTHETIST (Senior House Officer). Post vacant in February, 1953, tenable for 12 months, recognised for D.A. examination.

Apply Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (general surgery).

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (general surgery).

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (medical).

Applications, with copy testimonials, and details of previous appointments held, should be forwarded to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.) HOSPITAL MANAGEMENT COMMITTEE NO. 9 WAKEFIELD A GROUP. Applications are invited for the post of RESIDENT HOUSE SURGEON at the above Hospital. Terms and conditions of service in accordance with national recommendations.

Applications should be made to the Administrative Officer.

WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.) HOSPITAL MANAGEMENT COMMITTEE NO. 9 WAKEFIELD A GROUP. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN at the above Hospital. Terms and conditions of service in accordance with national recommendations.

Applications should be made to the Administrative Officer.

WAKEFIELD. STANLEY ROYD HOSPITAL. The services of a Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER are required at the above Hospital for the treatment of patients suffering from nervous and mental disorders. Salaries as follows: Junior Hospital Medical Officer £16 per week; Senior House Officer £13 per week. Appointment will be for a period of 2 months in first instance but may be extended. Accommodation can be provided at the Hospital for which a charge at the rate of £130 p.a. will be made.

Apply to undersigned with full particulars and 2 names and addresses for reference. G. L. BANNER, Group Secretary.
Victoria Chambers, Wood-street, Wakefield.

WATFORD PEACE MEMORIAL HOSPITAL AND SHRODELLS HOSPITAL, WATFORD. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required at above Hospitals which may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited from persons experienced in anæsthetics for the post of RESIDENT ANÆSTHETIST (Male or Female), graded as Senior House Officer. The Hospital is recognised for the D.A. examination. Salary is £670 p.a., less a deduction of £130 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to— H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARWICK HOSPITAL, Lakin-road, Warwick. (264 Beds.) Applications are invited for the post of RESIDENT MEDICAL OFFICER. The post, which is vacant on 21st April, is graded as Senior House Officer and is for duties on the Medical Wards under the supervision of the Consultant staff. The appointment gives good experience in general medicine and is suitable for an applicant working for a higher qualification.

Applications should be forwarded with copies of 2 testimonials, or the names of 2 referees, to the undersigned before 7th March, 1953.

R. F. N. HUNT, Administrative Officer.

WARWICKSHIRE. SOUTH WARWICKSHIRE HOS- PITAL GROUP (NO. 14). SENIOR HOUSE OFFICER (anæsthetics). Applications are invited from suitably qualified candidates for this appointment for duties mainly at the Warwick Hospital. The post becomes vacant at the end of May. Salary, terms and conditions of service in accordance with Ministry of Health terms and conditions of service.

Applications, stating age, qualifications and experience, together with the names and addresses of 3 referees, should be forwarded to the undersigned as soon as possible.

W. A. JAMES, Group Secretary.
87, Radford-road, Leamington Spa.

WARWICK (near). KING EDWARD VII MEMORIAL SANATORIUM, HERTFORD HILL. (Tuberculosis—239 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). Applications are invited for the post of SENIOR HOUSE OFFICER at the above Sanatorium, which is a modern building. All forms of therapy and medical surgery are carried out and the Sanatorium works in close association with a major Thoracic Surgery Unit in a nearby hospital.

Applications, together with the names of 3 referees, should be forwarded to the Medical Superintendent as soon as possible.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a SENIOR REGISTRAR in General Surgery to serve the Glantawe Hospital Management Committee. The successful candidate will be based at the Swansea Hospital and may also be expected to serve other hospitals within the Group. The appointment will be for a period of 2 years in the first instance, but subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WEST BROMWICH AND DISTRICT GENERAL HOS- PITAL, Edward-street, WEST BROMWICH. (144 Beds.) Applications are invited for the post of HOUSE SURGEON (first second, or third post). Range of salary £350–£450 p.a. according to experience, with deduction of £100 p.a. in respect of board and lodging. The post is tenable for 6 months.

Applications, together with 3 recent testimonials, should be submitted to—

JOHN O. ROBINS, Secretary, West Bromwich and
District Hospitals Management Committee Group (18).

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment, now vacant, of HOUSE SURGEON (first, second or third post). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WEST FIFE HOSPITALS BOARD OF MANAGEMENT. Applications are invited from suitably qualified and experienced medical practitioners for the posts (2) of HOUSE OFFICER (resident) in the Dunfermline and West Fife Hospital, Dunfermline (115 Beds). Salary £350–£450, and conditions of service in accordance with national agreements.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be lodged with the Medical Superintendent, Dunfermline and West Fife Hospital, Reid-street, Dunfermline, within 30 days of the date of publication of this advertisement.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. (225 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) for duties at the above and other hospitals in the Group. The post which will be vacant on 1st March, 1953, is tenable for 1 year, will be resident, and is recognised for the D.A. examinations. Wide experience in all branches of anæsthesia is available, and there are particular facilities for experience in major thoracic and orthopædic work.

Applications, stating age, experience, and nationality, together with the names of 2 referees, should be forwarded to the undersigned as soon as possible.

T. W. HURST, Secretary,
Wigan and Leigh Hospital Management Committee.
Knowsley House, Wigan.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. WORTHING HOSPITAL, Lyndhurst-road, WORTHING, SUSSEX. (272 Beds—5 Resident Officers.) Applications are invited from registered medical practitioners for post of HOUSE SURGEON for special departments (new appointment). Accommodation available for male or female staff. R practitioners within 3 months of qualification or holding a first post may apply. Salary £350–£450 according to experience, less £100 p.a. for board, lodging, &c. Appointment subject to conditions of service for the National Health Service.

Apply to Hospital Secretary, Worthing Hospital, stating age, qualifications with dates, nationality, and details of experience, together with copies of 2 recent testimonials.

A. V. OAKTON, Group Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the part-time appointment of GENERAL PRACTITIONER/CLINICAL ASSISTANT to undertake 3 sessions per week in the Geriatric Department of the above Hospital. In accordance with the terms and conditions of service of medical staff the salary payable will be £525 p.a.

Applications, stating age, qualifications, details of experience, and the names of 2 referees, should be sent to—

WILLIAM JONES, Secretary.
Maelor General Hospital, Wrexham.

WORCESTER ROYAL INFIRMARY. Applications are invited for the post of HOUSE SURGEON (general surgery/orthopædics) which is now vacant. The appointment is tenable for 6 months and is subject to the terms and conditions of service for hospital medical staff.

Applications, with copies of testimonials, should be sent to the Secretary as soon as possible.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

1 SENIOR REGISTRAR in Surgery.
1 REGISTRAR in Surgery.

Both posts are vacant on 1st June and will be non-resident. The Hospital is recognised for the F.R.C.S.

Forms of application obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester, must be completed and returned within 14 days of appearance of this advertisement.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR (Registrar grade), resident or non-resident, for Orthopædic Unit of the Group. The Group is served by orthopædic team covering Winchester, Southampton, Salisbury, and Isle of Wight areas. A wide variety of experience in orthopædic conditions is available and exchange of posts between neighbouring Groups is envisaged where desired.

Forms obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester, must be completed and returned within 14 days of appearance of this advertisement.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. HOUSE SURGEON (general and E.N.T.), vacant 2nd March. May be pre-registration post.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. HOUSE SURGEON (gynæcology) required, vacant 20th March. The Hospital is recognised by the Royal College. May be pre-registration post.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. HOUSE PHYSICIAN required, vacant 6th April. May be pre-registration post.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. HOUSE SURGEON (general and E.N.T.), vacant 16th March. May be pre-registration post.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE.

Military Hospital (Civilian Wing—60 Beds)

SENIOR HOUSE OFFICER (resident or non-resident), immediately. There are 18 gynæcological beds, 30 general surgical beds, and 12 medical beds. The Hospital is associated with the County Hospital (general hospital of 269 Beds) where relief casualty and emergency work and relief work for House Surgeons may be undertaken and where residence can be provided.

County Hospital, City Hospital, and Military Hospital (Civilian Wing), York (General hospitals of 269, 265 and 60 Beds respectively)

SENIOR HOUSE OFFICER in Anæsthetics (resident or non-resident) as from 1st March. Previous experience in anæsthetics desirable but not essential.

Salary £670, residence available at a charge of £153.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, immediately to Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorks

(*a*) SENIOR ORTHOPÆDIC HOUSE SURGEON, vacant now. Recognised for F.R.C.S.

(*b*) RESIDENT PATHOLOGIST (Senior House Officer), in Area Laboratory, with attendance at Branch Laboratory, Driffield. Post vacant shortly. Offers experience all branches pathology.

(*c*) HOUSE SURGEON (first, second, or third post), vacant now. General surgical duties, some orthopædics. Recognised for F.R.C.S.

East Riding General Hospital, Driffield, Yorks

(*d*) HOUSE PHYSICIAN (first, second, or third post), vacant now. Duties include medical and chronic wards, casualty and some anæsthetics and midwifery. Good general experience for first House appointment.

Broadgate (Mental) Hospital, Beverley, Yorks

(*e*) HOUSE PHYSICIAN (first, second, or third post), vacant 1st March, 1953.

Northfield Sanatorium, Driffield, Yorks

(*f*) HOUSE PHYSICIAN (first, second, or third post), vacant now. Sanatorium has 78 Beds for adults.

Salary for (*a*) and (*b*) is £670 p.a. and for (*c*), (*d*), (*e*), and (*f*) is £350–£450 according to previous posts held.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorks.

NEW YORK. ALBANY HOSPITAL. Anesthesiology RESIDENCY. Approved for 1 or 2 years ; for graduates of approved medical schools who have completed 1 year of an approved Internship. Medical college affiliation.

Apply to J. GERARD CONVERSE, M.D.
Albany Hospital, Albany, 1, New York, U.S.A.

NEW YORK. ALBANY HOSPITAL. Internships and RESIDENCIES available in 750-Bed, general, private Hospital, directly connected to Albany Medical College. Approved for all major specialties, including psychiatry, and accepted by the U.S. State Department as member of Exchange Visitor Program. Annual salary range is $1020 for Intern to $2120 for Resident, with laundry, uniforms, room, and annual vacation furnished. All appointments begin July, 1953.

Address inquiries to Medical Director, Albany Hospital, Albany, New York.

NEW YORK. ALBANY HOSPITAL. Approved Internship, ASSISTANT RESIDENCY, and RESIDENCY in E.N.T. available 1st July, 1953, in Albany Hospital, affiliated with Albany Medical College. Salary $1020–$2120. Room, uniforms, and laundry supplied.

Inquire, Medical Director, Albany Hospital, Albany, New York, U.S.A.

NEW YORK. ALBANY HOSPITAL, a large general hospital affiliated with Albany Medical College, is offering 2 FELLOWSHIPS in Cardiopulmonary Physiology and Chest Diseases for 12 months beginning 1st July, 1953. All cardiac and pulmonary physiological studies will be done under the guidance of Specialists. Excellent experience. Good pay.

Address inquiries to Medical Director, Albany Hospital, Albany, New York, U.S.A.

UNITED STATES. MOUNT AUBURN HOSPITAL, CAMBRIDGE, MASSACHUSETTS. Applications are invited for the positions of approved RESIDENCIES in Anesthesia for a 2-year period beginning 1st April, 1st July, and 1st October, 1953. Salary $1800 first year and $3000 second year, and full maintenance. Training in all branches of anesthesia. There is affiliation with other hospitals. Opportunity to attend various meetings in anesthesiology throughout the New England Area.

Applications, stating age, nationality, qualifications, and experience, together with the names of their referees, should be forwarded to the Director of Anesthesiology, Mount Auburn Hospital, Cambridge 38, Massachusetts. Travelling expenses to and from the U.S.A. will be paid, but particulars will be sent as soon as application is received. Please enclose recent photograph with application.

Public Appointments

ANGLESEY. COUNTY OF ANGLESEY. Applications are invited from medical practitioners holding the D.P.H. or similar qualification for the appointment of ASSISTANT COUNTY AND SCHOOL MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Borough of Beaumaris, the Urban Districts of Llangefni and Menai Bridge, and the Rural District of Aethwy. Salary in accordance with the national award for a combined appointment—£1306 5s., rising to £1593 15s. Starting-point according to experience. The national conditions of service, travelling allowance, &c., apply.

Application forms, to be returned to the undersigned by 14th March, 1953, may be obtained from the County Medical Officer of Health, Shire Hall, Llangefni.

WILLIAM JONES, Clerk of the County Council.

Shire Hall, Llangefni, Anglesey.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT SCHOOL AND ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER. Applications are invited from registered medical practitioners for this whole-time superannuable post. Salary £850 p.a., by annual increments of £50 to £1150 p.a., plus a car allowance on the Council's scale.

Particulars and application forms are obtainable from Dr. J. B. S. MORGAN, County Medical Officer, County Offices, St. Mary's-gate, Derby.

FACTORY DOCTORS: Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 8, St. James's-square, London, S.W.1

District	*County*	*Latest date for receipt of applications*
KNIGHTON ..	RADNOR	7TH MARCH, 1953
HALTWHISTLE ..	NORTHUMBERLAND ..	7TH MARCH, 1953

GREENOCK. CORPORATION OF GREENOCK. Health AND WELFARE DEPARTMENT. Applications are invited for the position of ASSISTANT MEDICAL OFFICER OF HEALTH, who may be Male or Female, to undertake duties principally relative to the Medical Inspection of School Children, together with duties in connection with the Maternity and Child Welfare Service in the Burgh. The salary payable will be at the rate of £850, rising to £1150 p.a., and the successful applicant will require to contribute to the Corporation's superannuation scheme. Full information regarding the duties of the post may be obtained on application to the Medical Officer of Health, 36, Nicolson-street, Greenock.

Applications, stating age, experience and qualifications, and accompanied by copies of not more than 3 recent testimonials, should be lodged with the undersigned not later than Wednesday, 4th March, 1953.

JOHN LIDDELL, Town Clerk.

Municipal Buildings, Greenock, 10th February, 1953.

HUDDERSFIELD. COUNTY BOROUGH OF HUDDERSFIELD. Applications are invited from duly qualified medical practitioners for the appointment of MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER of the County Borough of Huddersfield at a salary fixed in accordance with the terms of the Industrial Court Award (£1750 p.a., rising by 5 annual increments of £50 to £2000 p.a.). Applicants must possess a Diploma in Public Health or a similar qualification and should have had experience in the administration of the Public Health and School Medical Services. The person appointed will be required to reside in the Borough and to devote the whole of his time to the duties of the office and not to engage in private practice. The appointment is subject to the provisions of the appropriate superannuation act, to the passing of a medical examination by the Medical Officer of Health, and to termination by 3 months written notice on either side.

Applications, stating age, qualifications and experience, accompanied by 10 copies thereof and by 10 copies of 3 recent testimonials and endorsed "Medical Officer of Health," must reach me not later than Saturday, 28th February, 1953. Canvassing either directly or indirectly will disqualify.

HARRY BANN, Town Clerk.

The Town Hall, Huddersfield, 29th January, 1953.

LEEDS. CITY OF LEEDS. Public Health Department. Applications are invited from qualified and registered medical practitioners for 2 posts of ASSISTANT MEDICAL OFFICER for Maternity and Child Welfare. Applicants should have had postgraduate experience, preferably including obstetrics, antenatal work, and pædiatrics. The salary is on a scale of £850, rising by increments of £50 to a maximum of £1150. The persons appointed will be required to pass a medical examination and to contribute to the superannuation fund.

Application forms and particulars of the duties may be obtained from the undersigned at the Public Health Department, 25, East-parade, Leeds, 1, and completed applications should be returned by 10 A.M. on Monday, 2nd March, 1953. Canvassing in any form, either directly or indirectly, will be a disqualification.

I. G. DAVIES, Medical Officer of Health.

WESTMINSTER CITY COUNCIL AND HOLBORN BOROUGH COUNCIL. Joint appointment of PRINCIPAL ASSISTANT MEDICAL OFFICER OF HEALTH (permanent superannuable post). Salary £1250–£50–£1400 p.a. Applicants to be registered medical practitioners and to hold a registered Public Health qualification; age not to exceed 45 years. The person appointed will act as Principal Assistant Medical Officer of Health for the 2 Boroughs and (subject to the approval of the Minister of Health) as Deputy in the absence of both Medical Officers of Health at the same time. His services will be allocated in the proportion of three-fourths to Westminster; one-fourth to Holborn.

Applications marked "Principal Assistant Medical Officer of Health" stating age, war service, qualifications, present and past appointments, with copies of 3 recent testimonials to the Town Clerk, Westminster City Hall, Charing Cross-road, W.C.2, by 14th March, 1953.

MANCHESTER, CITY OF, HEALTH DEPARTMENT. MEDICAL OFFICER. Applications are invited from registered medical practitioners for appointment to the permanent staff of Medical Officers of the Health Department. Applicants should have obstetric and/or pædiatric experience, and will be required to undertake duties under the direction of the Medical Officer of Health, principally in maternity and child-welfare clinics. Possession of the D.C.H. or D.Obst.R.C.O.G. and D.P.H. qualifications will be an advantage. Salary scale £850, rising to £1150 p.a., subject to medical examination and City Council's conditions of service.

Application forms are obtainable on request and must be returned in an envelope marked "Medical Officer—Nursing Services," to the Town Clerk, Town Hall, Manchester, and not to any member of the Council, within 14 days of this advertisement. Canvassing is prohibited.

NORFOLK COUNTY COUNCIL. Applications are invited from registered medical practitioners holding the Diploma in Public Health for appointment as SENIOR MEDICAL OFFICER who will be responsible to the County Medical Officer for the mental health and school health services. Preference will be given to applicants who have had good experience of mental health, mental deficiency and school health service work. Salary scale £1250–£50–£1650 p.a., the commencing point to be fixed according to qualifications and experience.

Application forms, together with further details, can be obtained from the County Medical Officer, 29, Thorpe-road, Norwich, to whom completed application forms should be returned not later than 9th March, 1953.

SALFORD EDUCATION COMMITTEE. Applications are invited from registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER (full-time or part-time). Preference will be given to candidates with the D.C.H. or D.P.H. The duties will consist mainly in medical inspection of school-children, maternity and child welfare, and such other public-health work as the Medical Officer of Health and School Medical Officer may direct. Salary £850–£50–£1150 p.a. In fixing the commencing salary consideration will be given to experience and qualification. The appointment will be subject to the usual conditions of Local Government Service.

Forms of application may be obtained from the Director of Education, Education Office, Chapel-street, Salford, 3, to whom they should be returned not later than 7th March, 1953.

H. H. TOMSON, Town Clerk.

HER MAJESTY'S COLONIAL SERVICE. Malaya. A Doctor is required for the Malayan Medical Department for appointment as DEPUTY MEDICAL SUPERINTENDENT, Woodbridge (Mental) Hospital, Singapore, to carry out such duties in the Hospital and at Outpatient Clinics as may be required, and to assist in the teaching of medical staff. Candidates must possess medical qualifications registrable in the United Kingdom and a higher qualification in Psychiatry, and should be of the rank of at least Senior Registrar in the United Kingdom Health Service.

Appointment to the above post is available :—

(*a*) On probation for permanent and pensionable establishment.
(*b*) On employment from the National Health Service.
(*c*) On short-term contract with gratuity.

(*a*) *Permanent terms.* Subject to 3 years probation appointment is permanent with pension (non-contributory) at age of 55. Basic salary is £1764 p.a. In addition, pensionable expatriation pay is payable at the rate of £364 p.a. A non-pensionable expatriation allowance is paid to married Officers without children at the rate of £133 p.a., and to married Officers with children at the rate of £259 p.a. A temporary variable, non-pensionable cost-of-living allowance is payable at the rate of £42 p.a. for single men, £308 for married men, and £413 for married men with children.

(*b*) *National Health Service terms.* Doctors may resign from the National Health Service but retain their superannuation rights during their time in Malaya (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Malayan salary on leaving Malaya at the end of their engagements. Salary and allowances as under (*a*). Doctors so appointed may be considered for permanent terms at any time during their employment in Malaya provided they surrender their rights to the resettlement grant: payment by Malayan Governments of superannuation contributions ceases from date of permanent service.

(*c*) *Contract terms.* The contract will be for 3 years resident service, renewable for a further tour of 3 years by mutual agreement. Salary and allowances as under (*a*). In addition a gratuity earned at the rate of £300–£450 p.a., according to salary is paid on expiry of contract. Doctors on contract may be considered for appointment to the permanent establishment at any time on their agreeing to surrender their gratuity earning rights.

In all 3 types of appointment the rate of salary and gratuity refer to doctors eligible for "expatriate terms" under Malayan Regulations (i.e., those whose permanent homes are in the United Kingdom, Irish Republic, Australia, Canada, &c.).

The climate is, for the tropics, healthy. European children do well up to the age of about 6 and schools are available locally. Income-tax is payable at Malayan rates which are lower than those in the United Kingdom. Government quarters with heavy furniture are provided at a low rental, or an allowance is paid in lieu of quarters. Free passages are provided for the Doctor, his wife, and children under the age of 10 (not exceeding 4 persons besides himself) on appointment and once each way during each tour of duty of 3–4 years. Generous home leave is granted and local leave is permissible.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/60/013).

HER MAJESTY'S COLONIAL SERVICE. Malaya. Short-service appointment. A SPECIALIST ORTHOPÆDIC SURGEON is required on short-term engagement to take charge of an Orthopædic Department in the Federation of Malaya; to assist in teaching orthopædic work, &c., and the teaching of Intern House Surgeons. Candidates must have medical qualifications registrable in the United Kingdom and the F.R.C.S. with orthopædic experience, and should have an interest in the fitting of artificial limbs and orthopædic appliances. Appointment is on short-term contract for 3 years resident service, renewable for a further tour of 3 years by mutual agreement. A gratuity earned at the rate of £450 p.a. is paid on expiry of contract. Alternatively, doctors in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time in Malaya (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Malayan salary on leaving Malaya at the end of their engagements. Basic salary is £1764 p.a. In addition, expatriation pay is payable at the rate of £364 p.a. An expatriation allowance is paid to married Officers without children at the rate of £133 p.a., and to married Officers with children at the rate of £259 p.a. A temporary cost-of-living allowance is payable, at the rate of £42 p.a. for single Officers, £308 p.a. for married Officers and £413 p.a. for married Officers with children. The rate of salary and gratuity refers to doctors eligible for "expatriate terms" under Malayan Regulations (i.e., those whose permanent homes are in the United Kingdom, Irish Republic, Australia, Canada, &c.). The climate is, for the tropics, healthy. European children do well up to the age of about 6 and schools are available locally. Income-tax is payable at Malayan rates which are lower than those in the United Kingdom. Government quarters with heavy furniture are provided at a low rental, or an allowance is paid in lieu of quarters. Free passages are provided for the Surgeon, his wife, and children under the age of 10 (not exceeding 4 persons besides himself) on appointment and once each way during each tour of duty of 3 years. Generous home leave is granted and local leave is permissible.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/60/09).

HER MAJESTY'S COLONIAL SERVICE. Nigeria. Applications are invited from Doctors with medical qualifications registrable in the United Kingdom and with at least 1 years experience after qualification for the following posts in the Medical Department of the Government of Nigeria:—

(i) MEDICAL OFFICERS, for general duties in preventive and curative medicine which may include purely rural health work, involving much travelling.

(ii) MEDICAL OFFICERS OF HEALTH. Duties as under (i). In addition the selected officers would undertake the control of sanitary matters, and may be required to perform the duties of Port Health Officer at a seaport or airport. Candidates should possess a Diploma in Public Health. A Diploma in Tropical Hygiene, though not essential, is desirable.

(iii) PATHOLOGIST (Bacteriologist), to be capable of taking full charge of a routine bacteriology laboratory and of supervising the production of vaccines (e.g., smallpox, rabies, and T.A.B.). Candidates should have had experience of general bacteriology. Training or experience in virology and/or vaccine production would also be an advantage. A higher qualification, though not essential, would be considered a valuable asset. Opportunities and facilities exist for individual research work.

Appointments may be made as follows:—

(*a*) on 3 years probation for permanent and pensionable employment in the Colonial Medical Service, with retiring age of between 45 and 55. Pensions are at the rate of 1/600th of final pensionable emoluments for each completed month of reckonable service;

(*b*) from the National Health Service. Candidates may resign from the National Health Service but retain their superannuation rights during their time in Nigeria (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving Nigeria at the end of their engagement; or

(*c*) on short-term contract (2–4 tours of 18 months duration) with inclusive salary of from £1087 p.a., rising to £2000 p.a.; on completion of contract a gratuity is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Officers appointed under (*a*) or (*c*) are required to contribute to a Widows' and Orphans' Pension Scheme. Salaries, including pensionable expatriation pay for officers appointed under (*a*) or (*b*) range from £950 to £1850 p.a. Starting salary in all cases depends on experience and war service. Quarters are provided at low rents. Free passages in both directions are provided for Officer and his wife. Payment of the cost actually incurred on 1 outward and 1 homeward passage for each of 2 children under age of 18, subject to maximum of £75 in respect of the return journey for each child, is also granted. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of 18 months duration.

Application forms can be obtained from the Director of Recruitment, Colonial Service, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/14/01).

General Practice

For an Executive Council post apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

LIVERPOOL EXECUTIVE COUNCIL (Princes Park). Applications invited for Practice VACANCY (urban). Doctor resigning. List approximately 1300. Successor required to provide own accommodation. Apply on Form E.C.16A to the undersigned, not later than Wednesday, 4th March, 1953.

J. G. DONCASTER, Clerk of the Council.

36, Princes-road, Liverpool, 8.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Imperial Chemical Industries Limited, Alkali Division, Winnington, Northwich, Cheshire, require full-time Assistant Medical Officer at their Chemical Works at Northwich. Previous experience in industry desirable. Compulsory pension scheme. Housing available. Commencing salary according to age and experience to be discussed at interview, but not less than £1320 p.a. Engagement subject to satisfactory medical examination and references.—Write to Staff Manager, giving details of age, qualifications, experience and availability.

Imperial Chemical Industries Limited, Dyestuffs Division, has a vacancy in the Biological Laboratories at Blackley, Manchester, for a young graduate Pharmacologist to carry out experimental work in the field of Chemotherapy. Salary in accordance with qualifications and experience.—Please send applications in writing, giving details of career, to: Staff Department, Hexagon House, Blackley, Manchester, 9. Ref. "Pharmacologist."

Cameroons Development Corporation, Cameroons under British Trusteeship, West Africa. A vacancy exists for a Medical Officer in the service of the Cameroons Development Corporation, established by statute for the development of certain plantation areas in the British Cameroons. The appointment in the first instance will be for 1 tour of 12–24 months, with probability of renewal if service satisfactory. Candidates should have a good experience of general medical and health work, and preference will be given to those who either possess a Diploma in Tropical Medicine or have had tropical experience. The work chiefly consists of general medical and health supervision of all personnel in large plantations, but offers opportunity for surgery. First-class passages are provided to and from the Cameroons for Officers and their wives, together with free furnished accommodation during residence in the Cameroons. A reasonable amount of free lighting and fuel is also provided, and necessary transport. An outfit allowance of £80 is payable on first appointment. The salary is at the rate of £1440 rising by increments to £1840 p.a. over a period of 9 years; initial salary according to experience. Children's allowances are paid up to a maximum of 2, but children's passages are not paid. Officers of the Corporation are required to contribute 10% of their salary to a provident fund, the Corporation contributing 15%. The successful candidate will be required to take up the appointment towards the end of June, 1953.—Applications, giving full particulars in regard to qualifications and experience, together with copies of testimonials, all in triplicate, should be received by the Corporation's London agents, RUBBER & MINING AGENCIES LTD., 52, Leadenhall-street, London, E.C.3, on or before 31st March, 1953. Candidates should have performed their National Service.

Wanted. Female assistant for large practice, mainly women and children, in pleasant East Anglian area, Urban and Rural. Car provided, but must be able to drive.—Address, No. 786, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Nurse-Secretary, S.R.N./S.C.M., for group of 3 Doctors, Kidderminster. Commencing salary from £400 p.a., according to experience.—Apply, stating when available to commence duty, Address No. 785, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Lady requires post as receptionist to doctor or dentist, some nursing experience.—Address, No. 788, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Charming House, converted 17th-century cottages, beautiful garden. 5 bedrooms, central heating, main water, electricity. With foreman's cottage, small market-garden and cherry orchard. Herts. (50 mins. Harley-street.) Owner (Dr.) taking academic post North.—Address, No. 782, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wimpole-street. Cons. and Sec. suite to Let, £325 p.a.— Details: EASTBURNS, 24, Weymouth-street, W.1. LANgham 9178.

Consulting-rooms, full and part time, and Houses in the medical area.—ELGOOD & Co., 1, Bentinck-street, W.1 (WELbeck 8974).

Charming bed-sitting room offered professional lady in well-appointed flat in Harley-street.—Write, Address, No. 784, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method." 24-hour service.—Send specimen of urine and £1 1s. fee to: WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (Telephone: MUSeum 5386–7).

The British Journal of Medical Hypnotism. Quarterly, £1 1s. p.a.—Orders to the Publishers, 4, Victoria-terrace, Hove, 3, Sussex.

Genuine 17th Century Maps of every British County by Speed, Saxton, &c., &c. Exquisite colours. Absorbing detail. Fine sporting prints: hunting, shooting. &c.—FOLEY WHICKHAM, Antiques, 4, Royal Hotel Shops, Scarborough.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

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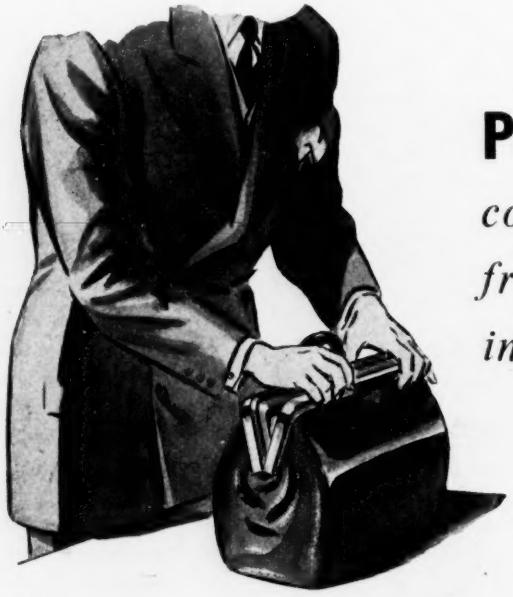

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